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*Program printed on March 23, 2019*

## Welcome Message

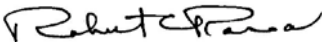
On behalf of the IEEE and officers of the IEEE Systems Council, I would like to extend a warm and cordial welcome to our attendees at the 13th Annual IEEE International Systems Conference (SysCon) here in the warm and sunny area of Orlando, Florida. You will be immersed in discussions involving systems engineering and complex systems with your peers and colleagues from industry, government, and academia, traveling to this southern state from all over the world.

We hope that the technical program we have planned for you is what you were anticipating, as it does cover all aspects of complex systems and systems of systems and the highly specialized systems engineering skills that accompany such systems. Our Technical Program Chair, Dr. Sidney Givigi, of the Royal Military College of Canada, has put in countless hours of his valuable time to select the most appropriate content from the truly outstanding candidate material submitted for presentation this week, and I ask you to help me in thanking him for his invaluable efforts.

To repeat that our ever-more complex world with its increasingly complex systems demands even greater attention to systems engineering may sound self-serving but it is totally true. Without a solid systems engineering foundation at the start, today's modern system complex systems will not meet expectations, let alone their budgets or schedules. And of course, we are talking systems for all purposes, from medical to banking & financial to transportation; communications, and military. And even individual components or elements within systems have grown exceptionally complex, such as a single aircraft within the air transportation system. Look at the complexity of a single autonomous vehicle within the ground transportation system as another example. These are the things we will address, along with new approaches to systems engineering methodologies and tools.

So please enjoy your visit and partake of the technical content that we offer you. We hope you enjoy not only this conference but your stay in Orlando at this elegant and luxurious hotel, where there are many sights to see (in the evenings, of course!) A visit to Walt Disney World or Universal Studios would be a great side trip. If there is anything we can do to make your visit more comfortable, please do not hesitate to contact one of our helpful staff.

And for planning purposes, the 14th Annual International Systems Conference will be in historic Montreal, Canada, on April 20-23, 2020, at the centrally-located Marriott Chateau Champlain.



Bob Rassa  
Conference Chair  
Past President, and Vice-President, Conferences, IEEE Systems Council

## Conference Committee

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### Technical Program Chair

Sidney Givigi, Royal Military College of Canada

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### **Technical Program Committee Reviewers (Continued)**

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Mitchell Thornton, Southern Methodist University, USA  
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Peter Whitehead, MITRE Corporation, USA  
Montri Wiboonrat, Faculty of Engineering, Thammasat University, Thailand  
Desheng Wu, Canada  
Leon Wu, Columbia University, USA  
Hen-Geul Yeh, California State University Long Beach, USA  
Jun Zheng, New Mexico Institute of Mining and Technology, USA  
Haifeng Zhu, UTRC, USA  
Armin Zimmermann, Ilmenau University of Technology, Germany

### **Conference Management**

Conference Catalysts, LLC

## Keynote Speaker

**Tuesday, April 9, 8:15 - 9:30**

**Room: Palm ABCDEF**

**Dinesh Verma, Ph.D.**

*Professor of Systems Engineering, School of Systems and Enterprises (SSE), Stevens Institute of Technology; Executive Director, Systems Engineering Research Center (SERC)*

### **Biography:**

Dinesh Verma received the Ph.D. (1994) and the M.S. (1991) in Industrial and Systems Engineering from Virginia Tech. He served as the Founding Dean of the School of Systems and Enterprises at Stevens Institute of Technology from 2007 through 2016. He currently serves as the Executive Director of the Systems Engineering Research Center (SERC), a US Department of Defense-sponsored University Affiliated Research Center (UARC) focused on systems engineering research. During his fifteen years at Stevens, he has successfully proposed research and academic programs exceeding \$150m in value. He has a courtesy appointment as a Visiting Professor in the Department of Biochemistry in the School of Medicine at Georgetown University. Verma served as Scientific Advisor to the Director of the Embedded Systems Institute in Eindhoven, Holland from 2003 through 2008. Prior to this role, he served as Technical Director at Lockheed Martin Undersea Systems, in Manassas, Virginia, in the area of adapted systems and supportability engineering processes, methods and tools for complex system development.

Before joining Lockheed Martin, Verma worked as a Research Scientist at Virginia Tech and managed the University's Systems Engineering Design Laboratory. While at Virginia Tech and afterward, Verma continues to serve numerous companies in a consulting capacity. He served as an Invited Lecturer from 1995 through 2000 at the University of Exeter, United Kingdom. His professional and research activities emphasize systems engineering and design with a focus on conceptual design evaluation, preliminary design and system architecture, design decision-making, life cycle costing, and supportability engineering. In addition to his publications, Verma has received three patents in the areas of life-cycle costing and fuzzy logic techniques for evaluating design concepts.

Dr. Verma has authored over 100 technical papers, book reviews, technical monographs, and co-authored three textbooks: Maintainability: A Key to Effective Serviceability and Maintenance Management (Wiley, 1995), Economic Decision Analysis (Prentice Hall, 1998), Space Systems Engineering (McGraw Hill, 2009). He was honored with an Honorary Doctorate Degree (Honoris Causa) in Technology and Design from Linnaeus University (Sweden) in January 2007, and with an Honorary Master of Engineering Degree (Honoris Causa) from Stevens Institute of Technology in September 2008.

## Young Professionals Networking Event

**Tuesday, April 9, 18:30 - 20:30**

**Room: Poinciana AB**

All attendees within the first 15 years of your first college degree are welcome to join us immediately following the formal reception on Tuesday April 9, in Palm DEF for discussion on careers and opportunities.

Are you interested in a career path revolving around “the big picture” of the systems you work on, viewing the system as a whole? Local systems engineering professionals are also invited to this event! We are offering a unique opportunity to meet, learn from, and network with, the systems engineering community. The event features a panel on systems engineering covering the career perspectives of experienced professionals from the domain of complex systems engineering.



## **The IEEE Systems Council Technical Committee for Human Systems Integration**

**Wednesday, April 10, 16:30 - 17:30**

**Room: Gardenia**

All are welcome to attend!

The Human System Integration (HSI) Technical Committee (TC) focuses on identifying and improving methods to integrate human concerns into the conceptualization and design of systems. It encourages early understanding of human roles and responsibilities, along with limitations and constraints that may impact system design. It also investigates human performance models that integrate with other simulation models to evaluate both system and human requirements. It embraces Model Based System Engineering as a way to include and communicate the human requirements into the system design.

Website: <http://ieeesystemscouncil.org/pages/human-system-integration-technical-committee>

For more information please contact the committee chair:

Holly A. H. Handley, PhD, PE  
[hhandley@odu.edu](mailto:hhandley@odu.edu)



| PROGRAM SCHEDULE - Monday, April 8, 2019 |   |   |  |
|--|---|---|--|
| REGISTRATION- OUTSIDE OF PALM            |   |   |  |
| Room                                     | Poinciana AB  | Poinciana CD  |  |
| 08:00 - 10:00                            | 1A1 – <i>Tutorial</i><br>The Beginner's Guide to Model-Based Systems Engineering (MBSE) | 1A2 – <i>Tutorial</i><br>Machine learning systems applied to unmanned systems |  |
| 10:00 - 10:15                            | BREAK   |   |  |
| 10:15 - 12:00                            | 1B1 – <i>Tutorial</i><br>The Beginner's Guide to Model-Based Systems Engineering (MBSE) | 1B2 – <i>Tutorial</i><br>Machine learning systems applied to unmanned systems |  |
| 12:00 - 13:00                            | LUNCH - HEMINGWAY'S RESTAURANT (TUTORIAL ATTENDEES ONLY)                                |   |  |
| 13:00 - 15:00                            | 1C1 – <i>Tutorial</i><br>Effective Communication and Analysis in the Age of MBSE        | 1C2 – <i>Tutorial</i><br>Systems Security Engineering                         |  |
| 15:00 - 15:15                            | BREAK   |   |  |
| 15:15 - 17:00                            | 1D1 – <i>Tutorial</i><br>Effective Communication and Analysis in the Age of MBSE        | 1D2– <i>Tutorial</i><br>Systems Security Engineering                          |  |

| PROGRAM SCHEDULE - Tuesday, April 9, 2019 |  |                          |                                 |   |   |
|---|--|--------------------------|---------------------------------|---|---|
| REGISTRATION- OUTSIDE OF PALM             |  |                          |                                 |   |   |
| Opening Remarks- Palm ABCDEF              |  |                          |                                 |   |   |
| Keynote Speaker - Dinesh Verma            |  |                          |                                 |   |   |
| BREAK                                     |  |                          |                                 |   |   |
| Executive Plenary Panel                   |  |                          |                                 |   |   |
| LUNCH- REGENCY 3/4                        |  |                          |                                 |   |   |
| Room                                      | Poinciana AB                                       | Poinciana CD             | Palm ABC                        | Palm DEF                                | Magnolia BC                                 |
| 13:30 - 15:00                             | 2C1: Decision Making for Complex Systems I         | 2C2: System Architecture | 2C3: Modeling and Simulation I  | 2C4: Model-Based Systems Engineering I  | 2C5: Complex Systems I                      |
| BREAK                                     |  |                          |                                 |   |   |
| 15:30 - 17:00                             | 2D1: Decision Making for Complex Systems II        | 2D2: Defense Systems     | 2D3: Modeling and Simulation II | 2D4: Model-Based Systems Engineering II | 2D5: Systems Engineering Education & Theory |
| WELCOME RECEPTION- PORTICO EAST           |  |                          |                                 |   |   |
| 18:30 – 20:30                             | Young Professionals Networking Event- Poinciana AB |                          |                                 |   |   |

| PROGRAM SCHEDULE - Wednesday, April 10, 2019 |      |  |                             |   |
|--|------|--|-----------------------------|---|
| REGISTRATION- OUTSIDE OF PALM                |      |  |                             |   |
| 07:00 - 17:00                                | Room | Poinciana AB                           | Poinciana CD                | Palm DEF                                    |
| 08:00 - 09:30                                |      | 3A1: Robotic and Unmanned Systems I    | 3A2: Systems Engineering I  | 3A4: Model-Based Systems Engineering III    |
| 09:30 - 10:00                                |      |  |                             |   |
| BREAK  |      |  |                             |   |
| 10:00 - 11:30                                |      | 3B1: Engineering Systems-of-Systems I  | 3B2: Systems Engineering II | 3B4: Autonomous Systems I                   |
| 11:30 - 13:00                                |      |  |                             | 3B5: Advanced Topics in Systems Engineering |
| BEST PAPER AWARD LUNCHEON-REGENCY BALLROOM   |      |  |                             |   |
| 13:00 - 14:30                                |      | 3D1: Engineering Systems-of-Systems II | 3D2: Cyber Security         | 3D4: Autonomous Systems II                  |
| 14:30 - 15:00                                |      |  |                             |   |
| BREAK  |      |  |                             |   |
| 15:00 - 16:30                                |      | 3E1: Medical Systems                   | 3E2: Transportation Systems | 3E4: Model Based Engineering IV             |
|  |      |  |                             |   |

| PROGRAM SCHEDULE - Thursday, April 11, 2019 |       |                                  |  |  |
|---|-------|----------------------------------|--|--|
| REGISTRATION- OUTSIDE OF PALM               |       |                                  |  |  |
| 08:00 - 11:30                               | Room  | Poinciana AB                     | Poinciana CD                               | Palm ABC      Palm DEF   |
| 08:00 - 09:30                               |       | 4A1: Advanced Systems Technology | 4A2: Sensors Applied to Autonomous Systems | 4A3: Systems Integration<br><br>4A4 - Novel Applications of Systems                                  |
| 09:30 - 10:00                               | BREAK |                                  |  |  |
| 10:00 - 11:30                               |       | 4B1: Socio-Technical Systems I   | 4B2: INCOSE Track                          | 4B3: Special Session for Aerospace Systems Engineering<br><br>4B4 - Robotic and Unmanned Systems III |

## Monday, April 8

**07:00 - 17:00**

**Registration**

**Room:** Outside of Palm

**08:00 - 10:00**

**1A1: The Beginner's Guide to Model-Based Systems Engineering (MBSE)**

**Room:** Poinciana AB

**08:00 - 10:00**

**1A2: Machine learning systems applied to unmanned systems**

**Room:** Poinciana CD

**10:00 - 10:15**

**Break**

**10:15 - 12:00**

**1B1: The Beginner's Guide to Model-Based Systems Engineering (MBSE)**

**Room:** Poinciana AB

**10:15 - 12:00**

**1B2: Machine learning systems applied to unmanned systems**

**Room:** Poinciana CD

**12:00 - 13:00**

**Lunch for Tutorial Attendees Only**

**Room:** Hemingway's Resturaunt

**13:00 - 15:00**

**1C1: Effective Communication and Analysis in the Age of MBSE**

**Room:** Poinciana AB

**13:00 - 15:00**

**1C2: Systems Security Engineering**

**Room:** Poinciana CD

**15:00 - 15:15**

**Break**

**15:15 - 17:00**

**1D1: Effective Communication and Analysis in the Age of MBSE**

**Room:** Poinciana AB

**15:15 - 17:00**

**1D3: Systems Security Engineering**

**Room:** Poinciana CD

**Presenters:** Logan Mailloux

**07:00 - 17:00**

**Registration**

**Room:** Outside of Palm

**08:15 - 08:30**

**Opening Remarks**

**Room:** Palm ABCDEF

**08:30 - 09:30**

**Keynote:** Dinesh Verma, *Professor of Systems Engineering, School of Systems and Enterprises (SSE), Stevens Institute of Technology Executive Director, Systems Engineering Research Center (SERC)*

**Room:** Palm ABCDEF

**09:30 - 10:00**

**Coffee Break**

**10:00 - 12:00**

**Executive Plenary Panel**

**Room:** Palm ABCDEF

**Title:** Handling Systems Security in Complex Systems **Moderator:** Bob Rassa, Raytheon

**Panelists:** Lt Col Logan Mailloux (USAF, USA)

Dr. Jim Lambert (University of Virginia, USA)

Sidney Givigi (Royal Military College, Canada)

David Long (President, Vitech and Former President, INCOSE)

**12:00 - 13:30**

**Lunch**

**Room:** Regency 3/4

**13:30 - 15:00**

**2C1: Decision Making For Complex Systems I**

**Room:** Poinciana AB

**Session Chair:** Steven Song (United States Military Academy & US Army, USA)

**A System Approach for Evaluating Current and Emerging Army Open-Source Intelligence Tools**

*Joshua Orcutt (United States Military Academy, USA)*

*Jongbum Chae (United States Military Academy, USA)*

*Daniel Graham (United States Military Academy, USA)*

*Michael Matthews (United States Military Academy, USA)*

*Adam Henderson (United States Military Academy, USA)*

*Steven Song (United States Military Academy & US Army, USA)*

**A Gas Lift Optimization System with Variable Choke and Action Constraints**

*Matthew Harris (ExxonMobil Upstream Research Company, USA)*

*Mahsa Memarzadeh (ExxonMobil Upstream Research Company, USA)*

*Cassandra Swanberg (ExxonMobil Upstream Research Company, USA)*

*Amr El-Bakry (ExxonMobil Upstream Research Company, USA)*

**Toward Building a Human-Cognition-in-the-Loop Supervisory Control System for Humanized Decision-Making**

*Qing Hui (University of Nebraska-Lincoln, USA)*

*Mehdi Firouznia (University of Nebraska-Lincoln, USA)*

*Chen Peng (University of Nebraska-Lincoln, USA)*

**Analysis of threats and countermeasures in NFV use cases**

*Ahmed Alwakeel (Florida Atlantic University, USA)*

*Abdulrahman Alnaim (Florida Atlantic University, USA)*

*Eduardo B. Fernandez (Florida Atlantic University, USA)*

13:30 - 15:00

2C2: System Architecture

Room: Poinciana CD

Session Chair: Arash Khabbaz Saberi (Eindhoven University of Technology, The Netherlands)

**Developing a Modelling Framework for Aligning the Human Aspects to the Physical System in Large Complex Systems**

*Farid Shirvani (University of Wollongong, Australia)*

*William Scott (SMART Infrastructure Facility, University of Wollongong, Australia)*

*Grace Kennedy (Associated Research Fellow, Australia)*

*Fatemeh Rezaeibagha (Associated Research Fellow, Australia)*

*Allan P Campbell (SMART Infrastructure Facility, University of Wollongong & UniSA, Australia)*

**On the impact of early design decisions on quality attributes of automated driving systems**

*Arash Khabbaz Saberi (Eindhoven University of Technology, The Netherlands)*

*John Vissers (TNO, The Netherlands)*

*Franciscus P. A. Benders (TNO, The Netherlands)*

**Evaluation of Ryzen 5 and Core i7 Processors with SPEC CPU 2017**

*Hitoshi Oi (The University of Aizu, Japan)*

**Fog Computing for Real-Time Accident Identification and Related Congestion Control**

*Arindrajit Seal (University of North Carolina at Charlotte, USA)*

*Sumanta Bhattacharyya (University of North Carolina at Charlotte, USA)*

*Arindam Mukherjee (University of North Carolina at Charlotte, USA)*

13:30 - 15:00

2C3: Modeling and Simulation I

Room: Palm ABC

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

**A Distributed Algorithm with Optimum Communication for Cyber Physical Systems: Multi-tank Process Case Study**

*Amjad Gawanmeh (Khalifa University, United Arab Emirates)*

*Swapnoneel Roy (University of North Florida, USA)*

*Alain April (ETS Engineering University, Canada)*

**Brushless DC Motor Speed Control Based on Advanced Sliding Mode Control (SMC) Techniques**

*Ahmed Taimour Hafez (Military Technical College, Egypt)*

*Amr Sarhan (Military Technical College, Egypt)*

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

**Modeling and Simulation Approach for Multi-Domain Environments (MASAME)**

*Paul C. Hershey (Raytheon, Inc., USA)*

**A Rigid Body Dynamics Simulation Framework for the Analysis of Attitude Control Systems of Modular Satellite Systems**

*Tobias Osterloh (RWTH Aachen University & Institute for Man-Machine Interaction, Germany)*

*Juergen Rossmann (Technical University of Aachen, Germany)*

13:30 – 15:00

**2C4: Model-Based Systems Engineering I**

**Room:** Palm DEF

**Session Chair:** Jerome Flender (Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen, Germany)

**Model-based Engineering of modern Automation Structures with the Interdisciplinary Modeling Language (IML)**

*Jerome Flender (Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen, Germany)*

*Simon Storms (Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen, Germany)*

*Werner Herfs (Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen, Germany)*

*Martin Witte (Siemens AG, Germany)*

**Model-Driven Design of Tools for Multi-Domain Systems with Loosely Coupled Metamodels**

*Bo Liu (FZI Research Center for Information Technology, Germany)*

*Victor Pazmino Betancourt (FZI Research Center for Information Technology, Germany)*

*Thomas Glock (FZI Research Center for Information Technology, Germany)*

*Matthias Kern (FZI Research Center for Information Technology, Germany)*

*Eric Sax (FZI Research Center for Information Technology, Germany)*

*Juergen Becker (Karlsruhe Institute of Technology, Germany)*

**Integrating the SBCE Principles with MBSE Methodology for the Mechatronic System's Design**

*Randa Ammar (SUPMECA, France)*

*Moncef Hammadi (SUPMECA & Laboratoire Quartz EA 7393, France)*

*Jean-Yves Choley (SUPMECA, France)*

*Maher Barkallah (ENIS, Tunisia)*

*Jamel Louati (ENIS, Tunisia)*

**The Beginner's Guide to Model-Based Systems Engineering (MBSE)**

*David Long (Vitech Corporation, USA)*

13:30 – 15:00

**2C5: Complex Systems I**

**Room:** Magnolia BC

**Session Chair:** Christine Edwards (Lockheed Martin & Stevens Institute of Technology, USA)

**Application of Hierarchical Colored Petri Nets for Real-Time Condition Monitoring of Internal Blowout Prevention (IBOP) in Top Drive Assembly System**

*Nadia Saad Noori (NORCE - Norwegian Research Center, Norway)*

*Tor Inge Waag (NORCE Norwegian Research Center, Norway)*

**Reuse Optimization and Tipping-Point Resilience in Supply Chains**

*Christine Edwards (Lockheed Martin & Stevens Institute of Technology, USA)*

*Roshanak Nilchiani (Stevens Institute, USA)*

*Jon Wade (Stevens, USA)*

*Karl Strickland (Lockheed Martin, USA)*

**A MatLab Computational Framework for Multiagent System Simulation of Financial Markets**

*Michel Leles (UFSJ, Brazil)*

*Elton Sbruzzi (Instituto Tecnológico de Aeronáutica, Brazil)*

*José M Parente de Oliveira (ITA, Brazil)*

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



## Tuesday, April 9

### **Moderation Effect of Managerial Experience on the Level of Systems Thinking Skills**

*Morteza Nagahi (Mississippi State University, USA)*

*Niamat Ullah Ibne Hossain (Mississippi State University, USA)*

*Raed Jaradat (Mississippi State University, USA)*

*Siobhan Grogan (Mississippi State University, USA)*

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**15:00 – 15:30**

**Break**

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**15:30 – 17:00**

### **2D1: Decision Making for Complex Systems II**

**Room:** Poinciana AB

**Session Chair:** Michel Leles (UFSJ, Brazil)

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### **Analysis of the Brazilian Research Agencies using a Multicriteria Decision Aid known as TODIM**

*Rachel Magalhaes (Universidade Federal Fluminense, Brazil)*

*Luís Alberto Rangel (Universidade Federal Fluminense, Brazil)*

*Elton Sbruzzi (Instituto Tecnológico de Aeronáutica, Brazil)*

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

*Michel Leles (UFSJ, Brazil)*

### **Reducing the Costs of Engineering Design Changes Through Adoption of a Decision Support and Knowledge Management System Early in the Design**

*Raymond Jonkers (Merlantec Management and Engineering, Canada)*

*Kamran Shahroudi (Colorado State University, USA)*

### **IAFDSS: Intelligent Agent-Assisted Fuzzy Decision Support System for Diffusion-Based Molecular Nano Communication Networks**

*Ghalib H Alshammri (Stevens Institute Of Technology, USA)*

*Walid Ahmed (Broadcom Inc., USA)*

*Victor Lawrence (Stevens Institute of Technology, USA)*

### **Grey Wolf Optimization Based Flexible Piezoelectric Energy Harvester for Hearing Aid Applications**

*Mangaiyarkarasi Padmanaaban (Anna University, Tamil Nadu, India)*

*Lakshmi P (Anna University, India)*

*V Sasrika (Anna University, India)*

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**15:30 – 17:00**

### **2D2: Defense Systems**

**Room:** Poinciana CD

**Session Chair:** Vikram Mittal (United States Military Academy, USA)

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### **A Systems Approach for Analyzing Operational Energy Requirements for the Warfighter**

*Vikram Mittal (United States Military Academy, USA)*

*Ryan Leemans (United States Military Academy, USA)*

### **Methods for Modeling Military Capabilities**

*Vesa Kuikka (Finnish Defence Research Agency, Finland)*

### **Modeling Network Resilience and Utility of Services**

*Vesa Kuikka (Finnish Defence Research Agency, Finland)*

### **Architecting Systems-of-Systems for Operational Feedback: A Study of Army Infantry Training Analysis**

*Stephen Gillespie (United States Military Academy & United States Army, USA)*

*John Caddell (United States Military Academy & US Army, USA)*

*John Goodwill (United States Military Academy, USA)*

*Jacob Shaha (United States Military Academy, USA)*

**15:30 – 17:00**

**2D3: Modeling and Simulation II**

**Room:** Palm ABC

**Session Chair:** Stephen Campbell

**Compose, OML, and Activate: A New Software Suite for Modeling and Simulation**  
*Stephen Campbell (North Carolina State University, USA)*

**Performability Model for Assessing NoSQL DBMS Consistency**

*Carlos Gomes Araújo (Federal University of Pernambuco, Brazil)*

*Eduardo Tavares (Federal University of Pernambuco, Brazil)*

*Eric Borba (Universidade Federal de Pernambuco, Brazil)*

*Meuse Oliveira Jr (Instituto Federal de Pernambuco, Brazil)*

**Evaluation of NoSQL DBMS in private cloud environment: An Approach Based on Stochastic Modeling**

*Matheus Dornelas Rodrigues (Federal University of Pernambuco, Brazil)*

*Eduardo Tavares (Federal University of Pernambuco, Brazil)*

*Carlos Gomes Araújo (Federal University of Pernambuco, Brazil)*

*Breno Vasconcelos (Federal University of Pernambuco, Brazil)*

**Assessing the Performance of Panel Data Synthesis Approach**

*James Lee (George Mason University, USA)*

*Wanru Li (George Mason University, USA)*

*Shou Matsumoto (George Mason University, USA)*

*Mohanad Ajina (George Mason University, USA)*

*Bahram Yousefi (System Architectures Laboratory, George Mason University, USA)*

*Kathryn Laskey (George Mason University, USA)*

**15:30 – 17:00**

**2D4: Model-Based Systems Engineering II**

**Room:** Palm DEF

**Session Chair:** Alexander Wichmann (Technische Universität Ilmenau, Germany)

**Platform-Independent Debugging of Physical Interaction and Signal Flow Models**

*Mehdi Dadfarnia (National Institute of Standards & Technology & University of Maryland, College, USA)*

*Raphael Barbau (Engisis LLC, USA)*

**Model-Driven Development of UML-Based Domain-Specific Languages for System Architecture Variants**

*Alexander Wichmann (Technische Universität Ilmenau, Germany)*

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

*Francesco Bedini (Technische Universität Ilmenau, Germany)*

*Armin Zimmermann (Ilmenau University of Technology & Systems and Software Engineering, Germany)*

**A meta-model based environment for GRAFCET specifications**

*Robert Julius (Helmut-Schmidt-University, Germany)*

*Alexander Fay (Helmut-Schmidt-Universität, Germany)*

*Thomas Trenner (Siemens AG, Germany)*

*Jörg Neidig (Siemens AG, Germany)*

*Xuan-Luu Hoang (Helmut-Schmidt-University & Institute of Automation Technology, Germany)*

## Tuesday, April 9

### **An approach for knowledge-based requirements definition for re-engineering of the process plant**

*Dmytro Adamenko (University Duisburg-Essen, Germany)*

*Steffen Kunnen (University Duisburg-Essen, Germany)*

*Robin Pluhnau (University Duisburg-Essen, Germany)*

*Arun Nagarajah (University Duisburg-Essen, Germany)*

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**15:30 – 17:00**

### **2D5: Systems Engineering Education & Theory**

**Room:** Magnolia BC

**Session Chair:** John Caddell (United States Military Academy & US Army, USA)

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### **HOUSTON, WE MAY HAVE A PROBLEM: Results of an exploratory inquiry on software developers' knowledge about Codes of Ethics**

*Fabiana Flores (Universidade Federal de Pernambuco (UFPE), Brazil)*

*Silvio Meira (Universidade Federal de Pernambuco, Brazil)*

### **Evaluating Teacher Impact on Student Performance: A Case Study at the United States Military Academy**

*Daniel Newell (United States Military Academy & US Army, USA)*

*John Caddell (United States Military Academy & US Army, USA)*

### **Application of Design Science Research to Design a Method for Model Driven Approaches**

*Farid Shirvani (University of Wollongong, Australia)*

*Pascal Perez (SMART Infrastructure Facility - University of Wollongong, Australia)*

*Ghassan Beydoun (University of Technology Sydney, Australia)*

*Allan P Campbell (SMART Infrastructure Facility, University of Wollongong & UniSA, Australia)*

*William Scott (SMART Infrastructure Facility, University of Wollongong, Australia)*

### **Planning and Runtime Monitoring of Robotic Manipulator using Metric Interval Temporal Logic**

*Zhenyu Lin (University of Maryland, USA)*

*John S. Baras (University of Maryland College Park, USA)*

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**17:30 - 18:30**

### **Welcome Reception**

**Room:** Portico East

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**18:30 - 19:30**

### **Young Professionals Networking Event**

**Room:** Poinciana AB

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**Registration**

**07:00 - 17:00**

**Room:** Outside of Palm

**08:00 - 09:30**

**3A1: Robotic and Unmanned Systems I**

**Room:** Poinciana AB

**Session Chair:** Kleber Cabral (Royal Military College of Canada, Canada)

**A System Theoretic Perspective on Transfer Learning**

*Tyler Cody (University of Virginia, USA)*

**Agent-Task Assignment Based on Target Characteristics for a Swarm of Specialized Agents**

*Omar Al-Buraiki (University of Ottawa, Canada)*

*Pierre Payeur (University of Ottawa, Canada)*

**The Formation Control of Mobile Autonomous Multi-Agent Systems Using Deep Reinforcement Learning**

*Qing Hui (University of Nebraska-Lincoln, USA)*

*Qishuai Liu (University of Nebraska-Lincoln, USA)*

**Design of a Self-Assembly System of Three-dimensional Structures using Autonomous Construction Blocks**

*Kleber Cabral (Royal Military College of Canada, Canada)*

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

*peter Travis Jarvine (Royal Military College of Canada, Canada)*

*Sergio Ronaldo Barros dos Santos (Federal University of Sao Paulo, Brazil)*

**08:00 - 09:30**

**3A2: Systems Engineering I**

**Room:** Poinciana CD

**Session Chair:** Yann Argotti (LAAS/CNRS - INSA & Renault Software Labs Company, France)

**Quality quantification in Systems Engineering from the Qualimetry Eye**

*Yann Argotti (LAAS/CNRS - INSA & Renault Software Labs Company, France)*

*Claude Baron (LAAS-CNRS, France)*

*Philippe Esteban (1 CNRS, LAAS, 7 av. du col. Roche, France)*

**Ultra Reliable Distributed Control for Cooperative Vehicular Cyber Physical Systems**

*Fotis Foukalas (Technical University of Denmark, Denmark)*

*Paul Pop (Technical University of Denmark, Denmark)*

**Towards Automating Design and Development of Inference Enterprise Models**

*James Lee (George Mason University, USA)*

*Shou Matsumoto (George Mason University, USA)*

*Abbas K Zaidi (System Architectures Laboratory, George Mason University, USA)*

*Kathryn Laskey (George Mason University, USA)*

**Systems Analysis of Army Long Range and Support Fire**

*Manuela Cortes (United States Military Academy, USA)*

*David Reeves (United States Military Academy, USA)*

*Chandler Ramirez (United States Military Academy, USA)*

*Zachary Scott (United States Military Academy, USA)*

08:00 - 09:30

**3A3: Modeling and Simulation III**

**Room:** Palm ABC

**Session Chair:** Rafael de Paula (Polytechnique de Montreal, Canada)

**Measuring the dynamic engagement with a system of equations - Theory demonstration and initial analysis**

*Rafael de Paula (Polytechnique de Montreal, Canada)*

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

*Emile Dimas and Carl Laroche (Polytechnique de Montreal, Canada)*

**An Interface-Oriented Resource Capability Model to Support Reconfiguration of Manufacturing Systems**

*Xuan-Luu Hoang (Helmut-Schmidt-University & Insitute of Automation Technology, Germany)*

*Sascha Backhaus (CTC GmbH, Germany)*

*Rolf Bense (Airbus Operation GmbH, Germany)*

*Alexander Fay (Helmut-Schmidt-Universität, Germany)*

*David Kuestner (Synergeticon GmbH, Germany)*

*Benjamin Schulze (Fraunhofer IFAM, Germany)*

**Neural Networks for End-to-End Refinement of Simulated Sensor Data for Automotive Applications**

*Jörn Thieling (RWTH Aachen University, Germany)*

*Philip Elspas (RWTH Aachen University, Germany)*

*Jürgen Roßmann (RWTH Aachen University, Germany)*

**A Pattern for an NFV Virtual Machine Environment**

*Abdulrahman Alnaim (Florida Atlantic University, USA)*

*Ahmed Alwakeel (Florida Atlantic University, USA)*

*Eduardo B. Fernandez (Florida Atlantic University, USA)*

08:00 – 09:30

**3A4: Model-Based Systems Engineering III Engineering Systems-of-Systems I**

**Room:** Palm DEF

**Session Chair:** Warren K. Vaneman (Naval Postgraduate School, USA)

**A Systems Dynamics Approach to Human Trafficking in Maharashtra, India**

*Ellie Senft (United States Military Academy, USA)*

*Benton Weeks (United States Military Academy at West Point, USA)*

*James Palmer (United States Military Academy, USA)*

*Benson Neely (United States Military Academy, USA)*

*Benjamin Turner (United States Military Academy, USA)*

*John Caddell (United States Military Academy & US Army, USA)*

**Model Management Tools for Models of Different Domains: A Systematic Literature Review**

*Wesley Silva Torres (Eindhoven University of Technology, The Netherlands)*

*Mark van den Brand (Eindhoven University of Technology, Netherlands, The Netherlands)*

*Alexander Serebrenik (Eindhoven University of Technology, The Netherlands)*

**Model-Based Systems Engineering Implementation Considerations**

*Warren K. Vaneman (Naval Postgraduate School, USA)*

*Ron Carlson (Naval Postgraduate School)*

**Exploring Immersive Simulation based Design Frameworks in Support of the Moon Mission**

*J. Cecil (Oklahoma State University & Cyber Tech LLC, USA)*

*Rajesh Krishnamurthy (Oklahoma State University, USA)*

*Avinash Gupta (Oklahoma State University, USA)*

08:00 – 09:30

**3A5: Complex Systems II**

**Room:** Magnolia BC

**Session Chairs:** Michel Leles (UFSJ, Brazil)

**Trading Switching Setup Based on Reinforcement Learning Applied to a Multiagent System Simulation of Financial Markets**

*Michel Leles (UFSJ, Brazil)*

*Elton Sbruzzi (Instituto Tecnológico de Aeronáutica, Brazil)*

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

*José M Parente de Oliveira (ITA, Brazil)*

**A Service-Oriented Human Capital Management Recommendation Platform**

*Maitrey Mehta (University of Utah, USA)*

*Raj Derasari (Ahmedabad University, India)*

*Shreyas Patel (Ahmedabad University, India)*

*Ashutosh Kakadiya (Ahmedabad University, India)*

*Ratnik Gandhi (Independent Consultant, India)*

*Sanjay R Chaudhary (Ahmedabad University, India)*

*Raxit Goswami (Hirevalley Inc., India)*

**Recursive Singular Spectrum Analysis Applied to the Design of a Trading System**

*Michel Leles (UFSJ, Brazil)*

*Adriano Cardoso (Universidade Federal de São João Del-Rei, Brazil)*

*Mariana Moreira (Universidade Federal de São João Del-Rei, Brazil)*

*Elton Sbruzzi (Instituto Tecnológico de Aeronáutica, Brazil)*

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

*Leonardo A Mozelli (UFMG, Brazil)*

*Homero Guimarães (Universidade Federal de Minas Gerais, Brazil)*

**Category Theoretic Based Formalization of the Verifiable Design Process**

*Nadew Kibret (North Carolina A & T State University, USA)*

*William Edmonson (North Carolina A&T State University, USA)*

*Solomon Gebreyohannes (NC A&T University, USA)*

09:30 – 10:00

Coffee Break

10:00 – 11:30

**3B1: Engineering Systems-of-Systems I**

**Room:** Poinciana AB

**Session Chair:** Oliver Constantin Eichmann (Hamburg University of Technology, Germany)

**System of Systems Strand Tilt Analysis Perspective on Medium/High Voltage Stator Bar and a Non-Destructive Testing Case Study**

*Gopal Singh (University of Central FLorida/ Siemens Gamesa Renewable Energy, USA)*

**Model-based Development of a System of Systems Using Unified Architecture Framework (UAF): A Case Study**

*Oliver Constantin Eichmann (Hamburg University of Technology, Germany)*

*Sylvia Melzer (Hamburg University of Technology, Germany)*

*Ralf God (Hamburg University of Technology, Germany)*

**Experiences of Using Linked Data and Ontologies for Operational Data Sharing in Systems-of-Systems**

*Jakob Axelsson (Mälardalen University & RISE Research Institutes of Sweden, Sweden)*

**A Framework for the Deployment of an Electronic Medical Record ecosystem**

*Dimitrios Xanthidis (Higher Colleges of Technology & CIBER-Research, United Arab Emirates)*

*Ourania Koutzampasopoulou (University of Malaya, Malaysia)*

10:00 – 11:30

**3B2: Systems Engineering II**

**Room:** Poinciana CD

**Session Chair:** Nader Mohamed (Middleware Technologies Lab., USA)

**The Impact of Industry 4.0 on Healthcare System Engineering**

*Nader Mohamed (Middleware Technologies Lab., USA)*

*Jameela Al-Jaroodi (Robert Morris University, USA)*

**Automated Driving - Challenges for the Automotive Industry in Product Development with Focus on Process Models and Organizational Structure**

*Raphael Pfeffer (Karlsruhe Institute of Technology, Germany)*

*Gustav Basedow (Karlsruhe Institute of Technology, Germany)*

*Nina Thiesen (Karlsruhe Institute of Technology, Germany)*

*Markus Spadinger (Karlsruhe Institute of Technology, Germany)*

*Albert Albers (Karlsruhe Institute of Technology (KIT), Germany)*

*Eric Sax (Karlsruhe Institute of Technology, Germany)*

**Text Analysis Approach to Systems Engineers' Effectiveness in an Organization**

*Shikha Soneji (Stevens Institution of Technology, USA)*

*Suchita Jairam Kothari (Stevens Institute of Technology, USA)*

*Sergio Luna (Stevens Institute of Technology, USA)*

*Hoong Yan See Tao (Stevens Institute of Technology, USA)*

*Araceli Zavala (Stevens Institution of Technology, USA)*

*Nicole Hutchison (Stevens Institute of Technology, USA)*

*Pamela Burke (Stevens Institute of Technology, USA)*

*Jose Ramirez-Marquez (Stevens Institute of Technology, USA)*

**Simulation Model and Comparative Analysis of Production Resources in a Modified Assembly Process**

*Alexander Eierle (Florida Institute of Technology, USA)*

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

*Luz Ortega (Florida Institute of Technology, USA)*

10:00 – 11:30

**3B3: Robotic and Unmanned Systems II**

**Room:** Palm ABC

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

**Compensation for Time Delays in the Navigation of Unmanned Aerial Vehicles**

*Walter Aburime (Carleton University, Canada);*

*Howard Schwartz (Carleton University, Canada)*

*Sidney Givigi (School of Computing, Queen's University, Kingston Ontario, Canada)*

**Single-Rate versus Three-Rate Neural Assisted Control Approaches for Coaxial Rotor Ducted Fan TUAV for Situation Awareness Applications**

*Andrus Pedai (TalTech, Estonia)*

*Igor Astrov (TalTech, Estonia)*

*Andres Udal (TalTech, Estonia)*

*Raivo Sell (TalTech, Estonia)*

**Manipulating Soft Tissues by Deep Reinforcement Learning for Autonomous Robotic Surgery**

*Ngoc Duy Nguyen (Institute for Intelligent Systems Research and Innovation, Deakin University, Australia)*

*Thanh Nguyen (Deakin University, Australia)*

*Saeid Nahavandi (Deakin University, Australia)*

*Asim Bhatti (Deakin University, Australia)*

*Glenn Guest (Faculty of Health, Deakin University, Australia)*

**Modeling Tree Canopy Signal Power Path Loss (SPPL) for Deployment of Wireless Communication Systems (WCS) Using Point Cloud and Sensor Fusion**

*Yunus Egi (302 Yale Avenue, USA)*

*Carlos Otero (Florida Institute of Technology, USA)*

**10:00 – 11:30**

**3B4: Autonomous Systems I**

**Room:** Palm DEF

**Session Chair:** Levent Yilmaz (Auburn University, USA)

**A Cognitive Architecture for Verifiable System Ethics via Explainable Autonomy**

*Levent Yilmaz (Auburn University, USA)*

**Advantageous Usage of Textual Domain-Specific Languages for Scenario-Driven Development of Automated Driving Functions**

*Florian Bock (Friedrich-Alexander University & AUDI AG, Germany)*

*Christoph Sippl (AUDI AG, Germany)*

*Aaron Heinz (AUDI AG, Germany)*

*Christoph Lauer (Audi AG, Germany)*

*Reinhard German (University of Erlangen, Germany)*

**Target Area Surveillance Optimization with Swarms of Autonomous Micro Aerial Vehicles**

*Robert Koeneke, Radu F. Babiceanu (Embry-Riddle Aeronautical University, USA)*

*Remzi Seker (Embry-Riddle Aeronautical University, USA)*

**A Comparative Study of Algorithms and Methods for Facial Expression Recognition**

*Osamah Al-Omair (Florida Atlantic University, USA)*

*Shihong Huang (Florida Atlantic University, USA)*

**10:00 – 11:30**

**3B5: Advanced Topics Systems Engineering**

**Room:** Magnolia BC

**Session Chair:** Neena Imam (Oak Ridge National Laboratory, USA)

**V2X System Architecture Utilizing Hybrid GP-based Model Structures**

*Hossein Nourkhi Mahjoub (University of Central Florida, USA)*

*Behrad Toghi (University of Central Florida, USA)*

*S M Osman Gani (University of Central Florida, USA)*

*Yaser P. Fallah (University of Central Florida, USA)*

**Towards an Evolving Toolbox in Complex Systems Management**

*Alex Gorod (The University of Adelaide, Australia)*

*Leonie Hallo (The University of Adelaide, Australia)*



**A Case Study of MPI Over Long Distance Connections**

*Nageswara Rao (Oak Ridge National Laboratory, USA)*

*Neena Imam (Oak Ridge National Laboratory, USA)*

*Swen Boehm (Oak Ridge National Laboratory, USA)*

**Architecting the Next Generation Computing platform to deliver Protected Differentiated Services**

*Bassam S Farroha (US DoD, USA); Deborah Farroha (DoD, USA)*

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**11:30 - 13:00**

**Best Paper Awards Luncheon**

**Room:** Regency Ballroom

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**13:00 – 14:30**

**3D1: Engineering Systems-of-Systems II**

**Room:** Poinciana AB

**Session Chair:** James J Mulcahy (Florida Atlantic University & MEDNAX, USA)

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**Decentralized Energy Management for Smart Home System of Systems**

*Jan Michael (Fraunhofer Institut for Mechatronic Systems Design, Germany)*

*Christian Henke (Fraunhofer IEM, Germany)*

*Ansgar Trächtler (Universität Paderborn, Germany)*

**A Middleware Framework to Address Security Issues in Integrated Multisystem Applications**

*Nader Mohamed (Middleware Technologies Lab., USA)*

*Jameela Al-Jaroodi (Robert Morris University, USA)*

**Leveraging Mobile Technology to Improve First-Time Patient-Provider Information Exchange**

*James J Mulcahy (Florida Atlantic University & MEDNAX, USA)*

*Shihong Huang (Florida Atlantic University, USA)*

**Mapping a Virtual View to the Physical World to Guide the Completion of Complex Task Sequences**

*Bach Tran (University of Akron, USA)*

*Shivakumar Sastry (University of Akron, USA)*

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**13:00 – 14:30**

**3D2: Cyber Security**

**Room:** Poinciana CD

**Session Chair:** Logan Mailloux (Air Force Institute of Technology & United States Air Force, USA)

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**A Top Down Approach for Eliciting Systems Security Requirements for a Notional Satellite System**

*Logan Mailloux (Air Force Institute of Technology & United States Air Force, USA)*

*Martin Span, III (United States Air Force Academy & United States Air Force, USA)*

*Robert F Mills (Air Force Institute of Technology, USA)*

*William Young (United States Air Force, USA)*

**Hash Vine: A New Hash Structure for Scalable Generation of Hierarchical Hash Codes**

*Miraz Uz Zaman (Louisiana Tech University, USA)*

*Tong Shen (Louisiana Tech University, USA)*

*Manki Min (Louisiana Tech University, USA)*

**Cyber Security Assessment of the Robot Operating System 2 for Aerial Networks**

*Preetha Thulasiraman (Naval Postgraduate School, USA)*

*Sergio Sandoval (Naval Postgraduate School, USA)*

**Privacy Policies Model in Access Control**

*Jorge Werner (Federal University of Santa Catarina, Brazil)*

*Carla Merkle Westphall (Federal University of Santa Catarina, Brazil)*

*André Vargas (UFSC, Brazil)*

*Carlos Becker Westphall (Federal University of Santa Catarina, Brazil)*

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**3D3: Communication Systems**

**Room:** Palm ABC

**Session Chair:** David Mattos (Chalmers University of Technology, Sweden)

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**Automated Optimization of Software Parameters in a Long-Term Evolution Radio Base Station**

*David Mattos (Chalmers University of Technology, Sweden)*

*Jan Bosch (Chalmers University of Technology, Sweden)*

*Helena Holmström Olsson (Malmö University, Sweden)*

*Anas Dakkak (Ericsson, Sweden)*

*Krister Bergh (Ericsson, Sweden)*

**Software-Defined End-to-End Evaluation Platform for Quality of Service in Non-Standalone 5G Systems**

*Karsten Heimann (TU Dortmund University, Germany)*

*Philipp Gorczak (TU Dortmund, Germany)*

*Caner Bektas (TU Dortmund University, Germany)*

*Felix Girke (TU Dortmund University, Germany)*

*Christian Wietfeld (TU Dortmund University, Germany)*

**Miniaturized Reconfigurable Antenna Based on Half-Mode Substrate Integrated Waveguide**

*Nima Javanbakht (Carleton University, Canada)*

*Barry Syrett (Carleton University, Canada)*

*Rony E. Amaya (Carleton University, Canada)*

*Jafar Shaker (Communications Research Centre, Canada)*

**An Ensemble Learning for Detecting Situational Awareness Tweets during Environmental Hazards**

*Adel Alshehri (University of South Florida, USA)*

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**13:00 – 14:30**

**3D4: Autonomous Systems II**

**Room:** Palm DEF

**Session Chair:** Khaled A Slhoub (Florida Institute of Technology, USA)

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**Real-Time Navigation in Urban Areas Using Mobile Crowd-Sourced Data**

*Xiangpeng Wan (Stevens Institute of Technology, USA)*

*Hakim Ghazzai (Stevens Institute of Technology & Stevens, USA)*

*Yehia Massoud (Stevens Institute of Technology, USA)*

**Evaluation and Comparison of Agent-Oriented Methodologies: A Software Engineering Viewpoint**

*Khaled A Slhoub (Florida Institute of Technology, USA)*

*Marco M Carvalho (Florida Institute of Technology, USA)*

*Fitzroy Nembhard (Florida Institute of Technology, USA)*

**Autonomous Navigation of a Small-Scale Ground Vehicle Using Low-Cost IMU/GPS Integration for Outdoor Applications**

*Humberto Almeida (Instituto Tecnológico de Aeronáutica, Brazil)*

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

*Douglas Santos (Instituto Tecnológico de Aeronáutica, Brazil)*

*Michel Leles (UFSJ, Brazil)*

**An Improved Scalarization-based Dominance Evolutionary Algorithm for Many-Objective Optimization**

*Burhan Khan (Deakin University, Australia)*

*Samer Hanoun (Deakin University, Australia)*

*Michael Johnstone (Deakin University, Australia)*

*Chee Peng Lim (Deakin University, Australia)*

*Doug Creighton (Deakin University, Australia)*

*Saeid Nahavandi (Deakin University, Australia)*

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**14:30 – 15:00**

**Break**

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**15:00 – 16:30**

**3E1: Medical Systems**

**Room:** Poinciana AB

**Session Chair:** Joe Cecil

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**Electronic Controller Design of a Semi-Automatic Cell Microinjection System**

*Osman Hasan (National University of Sciences and Technology, Pakistan)*

*Asad Hameed (National University of Sciences and Technology, Pakistan)*

**The Role of Information Centric Frameworks in supporting Cyber-Physical Collaboration for Emerging Process Domains**

*J. Cecil (Oklahoma State University & Cyber Tech LLC, USA)*

**An Approach to Supervised Classification of Highly Imbalanced and High Dimensionality COPD Readmission Data on HPCC**

*Piyush Jain (Florida Atlantic University, USA)*

*Ankur Agarwal (Florida Atlantic University, USA)*

*Ravi Behara (Florida Atlantic University, USA)*

**Conceptual Framework For Enhanced Neural Encoding and Decoding Utilizing Optically Pumped Magnetometers (OPM) and Transcranial Magnetic Stimulation (TMS)**

*Michael Jernigan (Florida Polytechnic University, USA)*

*Ryan Integlia (Florida Polytechnic University, USA)*

*Jennifer Rodgers (University of South Florida, USA)*

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**15:00 – 16:30**

**3E2: Transportation Systems**

**Room:** Poinciana CD

**Session Chair:** Michael Lucic (Stevens Institute of Technology, USA)

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**System-of-Systems Modeling, Analysis and Optimization of Hybrid Vehicular Traffic**

*Benjamin Sliwa (TU Dortmund University, Germany)*

*Thomas Liebig (TU Dortmund University, Germany)*

*Tim Vranken (University of Duisburg-Essen, Germany)*

*Michael Schreckenber (University of Duisburg-Essen, Germany)*

*Christian Wietfeld (TU Dortmund University, Germany)*

**Systems Evaluation for Access Management of Multiscale Transportation Networks**

*Marwan Alsultan (University of Virginia, USA)*

*Jungwook Jun (Virginia Department of Transportation, USA)*

*James H. Lambert (University of Virginia, USA)*

**Sensitivity Analysis in a BRT System**

*Renata Cristine Dantas (Federal University of Pernambuco - UFPE, Brazil)*

*Jamilson Dantas (University Federal of Pernambuco & UFPE, Brazil)*

*Carlos Melo (UFPE, Brazil)*

*Danilo Oliveira (Federal University of Pernambuco, Brazil)*

*Paulo Maciel (Federal University of Pernambuco, Brazil)*

**A Generalized and Dynamic Framework for Solar-Powered Roadside Transmitter Unit Planning**

*Michael Lucic (Stevens Institute of Technology, USA)*

*Hakim Ghazzai (Stevens Institute of Technology & Stevens, USA)*

*Yehia Massoud (Stevens Institute of Technology, USA)*

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**15:00 – 16:30**

**3E3: Energy Management and Sustainability**

**Room:** Palm ABC

**Session Chair:** Ionut Cardei (Florida Atlantic University, USA)

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**Industry 4.0: Opportunities for Enhancing Energy Efficiency in Smart Factories**

*Nader Mohamed (Middleware Technologies Lab., USA)*

*Jameela Al-Jaroodi (Robert Morris University, USA)*

*Sanja Lazarova-Molnar (University of Southern Denmark, Denmark)*

**Cascading Failure Analysis for Ocean Energy Turbine Generator Arrays**

*Ionut Cardei (Florida Atlantic University, USA)*

*Davy Pardonner (University of West Florida, USA)*

**A Game Theoretic Approach to Energy Trading in Multi-Microgrid Systems**

*Xingzheng Zhu (The University of Hong Kong, Hong Kong)*

*Xiangyu Chen (The University of Hong Kong, Hong Kong)*

*Ka-Cheong Leung (The University of Hong Kong, Hong Kong)*

**Sustainability Function Deployment: A system-level design-for-sustainability**

*Raid Al-Aomar (Abu Dhabi University & College of Engineering, United Arab Emirates)*

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**15:00 – 16:30**

**3E4: Model Based Engineering IV**

**Room:** Palm DEF

**Session Chair:** Henri Sohier (IRT SystemX, France)

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**A toolled methodology for the system architect's needs in simulation with autonomous driving application**

*Henri Sohier (IRT SystemX, France)*

*Sahar Guermazi (Sherpa Engineering, France)*

*Mouadh Yagoubi (IRT SystemX, France)*

*Pascal Lamothe (PSA Groupe, France)*

*Aldo Maddaloni (Renault, France)*

*Pascal Menegazzi (Valeo, France)*

*Yining Huang (IRT SystemX, France)*

**Human Factors in the Unified Architecture Framework Applied to Space Situational Awareness**

*Oksana Carlson (University of Arizona, USA)*

*Sara Hohenstein (University of Arizona, USA)*

**Wednesday, April 10**

**A Practitioner's Guide to Optimizing the Interactions Between Modelers and Domain Experts**

*Allison Doren (The MITRE Corporation, USA)*

*Aleksandra Markina-Khusid (The MITRE Corporation, USA)*

*Matthew Cotter (The MITRE Corporation, USA)*

*Cynthia Dominguez (The MITRE Corporation, USA)*

**Effective Communication and Analysis in the Age of MBSE**

*David Long (Vitech Corporation, USA)*

**08:00 - 12:00**

**Registration**

**Room:** Outside of Palm

**08:00 - 09:30**

**4A1: Advanced Systems Technology**

**Room:** Poinciana AB

**Session Chair:** Debora Goldwasser (Johns Hopkins Applied Physics Lab, USA)

**Systems Modeling and Optimization of Container Ship Berthing with Various Enterprise Risks**

*Heimir Thorisson (University of Virginia, USA)*

*Cody Pennetti (University of Virginia, USA)*

*Daniel Andrews (University of Virginia, USA)*

*Daniel Hendrickson (Virginia Port Authority, USA)*

*Thomas Polmateer (University of Virginia, USA)*

*James H. Lambert (University of Virginia, USA)*

**Model-Based Systems Engineering as the Catalyst for a Rapid Acquisition Process**

*Debora Goldwasser (Johns Hopkins Applied Physics Lab, USA)*

*Christopher Ryder (Johns Hopkins Applied Physics Laboratory, USA)*

**Compatibility of Battery and Ultra-Capacitor Cells Equalization for Hybrid Energy Storage System**

*Zahra Amjadi (Florida poly Technic University, USA)*

**Analyzing the Architecture Advantages and Vulnerabilities in the Heterogeneous 5G Wireless Networks**

*Bassam S Farroha (US DoD, USA)*

*Deborah Farroha (DoD, USA)*

**08:00 - 09:30**

**4A2: Sensors Applied to Autonomous Systems**

**Room:** Poinciana CD

**Session Chair:** Ahmed Abdelhadi (University of Houston, USA)

**Horus Testbed: Implementation of Real-Time Video Streaming Protocols**

*Ahmed Abdelhadi (University of Houston, USA)*

*Andreas Gerstlauer (The University of Texas at Austin, USA)*

*Sriram Vishwanath (University of Texas Austin, USA)*

**Design and Implementation of Fuzzy-PID Controller for an Active Quarter Car Driver Model to minimize Driver Body Acceleration**

*Swethamarai Paneerselvam (Anna University, India)*

*Lakshmi P (Anna University, India)*

**UAV-aided Weak-Barrier Coverage with Adaptive Sensor Rotation**

*Catalina Aranzazu-Suescun (Florida Atlantic University, USA)*

*Mihaela Cardei (Florida Atlantic University, USA)*

**Real-Time Rate Distortion Optimized and Adaptive Low Complexity Algorithms for Video Streaming**

*Ahmed Abdelhadi (University of Houston, USA)*

*Andreas Gerstlauer (The University of Texas at Austin, USA)*

*Sriram Vishwanath (University of Texas Austin, USA)*

**08:00 – 09:30**

**4A3: Systems Integration**

**Room:** Palm ABC

**Session Chair:** Houssein Guissouma (Karlsruhe Institute of Technology, Germany)

**Virtual Test Environment for Efficient Verification of Software Updates for Variant-Rich Automotive Systems**

*Houssein Guissouma (Karlsruhe Institute of Technology, Germany)*

*Andreas Lauber (Karlsruhe Institute of Technology, Germany)*

*Amir Mkaem (Karlsruhe Institute of Technology (KIT), Germany)*

*Eric Sax (Karlsruhe Institute of Technology, Germany)*

**A literature survey of multiple discipline integration keywords, based on a process, model, and knowledge classification**

*Gisela Anaïd Garza Morales (University of Twente, The Netherlands)*

*Marcus Vinicius Pereira Pessoa (University of Twente, The Netherlands)*

*G. Maarten Bonnema (University of Twente, The Netherlands)*

*Marco W. Groll (University of Twente & Daimler AG, Germany)*

**A Survey on Systems Engineering Methodologies for Large Multi-Energy Cyber-Physical Systems**

*Elmehdi Azzouzi (Institut Supérieur de Mécanique de Paris - Supméca & EDF R&D, France)*

*Daniel Bouskela and Audrey Jardin (EDF, France)*

*Jean-Yves Choley (SUPMECA, France)*

*Faïda Mhenni (SUPMECA & Laboratoire Quartz, France)*

**Command and Control for Distributed Lethality**

*Paul Beery and Eugene Paulo (Naval Postgraduate School, USA)*

*Michael Enloe (Naval Undersea Warfare Center, USA)*

*Erik Kelly (Naval Undersea Warfare Center, USA)*

*Keren Kummer (Naval Undersea Warfare Center, USA)*

*Gerald Kummer (Naval Undersea Warfare Center, USA)*

*Scott Watson (Naval Undersea Warfare Center, USA)*

*Logan Corbett (Naval Undersea Warfare Center, USA)*

*Sarah Smith (Naval Undersea Warfare Center, USA)*

*Bill Jankowski (Naval Undersea Warfare Center, USA)*

**08:00 – 09:30**

**4A4: Novel Applications of Systems**

**Room:** Palm DEF

**Session Chair:** Prasad Desai (Stevens Institute of Technology, USA)

**A Wearable Mobile Exergaming System for Activity Recognition and Relaxation Awareness**

*Jenario Johnson (Florida Polytechnic University, USA)*

*Eric Williams (Florida Polytechnic University, USA)*

*Michael A Swindon (Florida Polytechnic University, USA)*

*Sherif S. Rashad (Morehead State University, USA)*

*Ryan Integlia (Florida Polytechnic University, USA)*

*Kendon Ricketts (Florida Polytechnic University, USA)*

*Behzad Mottahed (School of Engineering Stevens Institute of Technology, USA)*

**Application of Machine Learning Algorithms for Visibility Classification**

*Luz Ortega (Florida Institute of Technology, USA)*

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

*Carlos Otero (Florida Institute of Technology, USA)*

**Agile and Affordable: A Survey of Supply Chain Management Methods in Long Lifecycle Products**

*Razieh Saremi (Stevens Institute of Technology, USA)*

*Prasad Desai (Stevens Institute of Technology, USA)*

*Steven Hoffenson (Stevens Institute of Technology, USA)*

*Carlo Lipizzi (Stevens Institute of Technology, USA)*

**Power Enhancement of MEMS Based Piezoelectric Energy Harvester for Bio-Fuel Cells**

*V Sasrika (Anna University, India)*

*Lakshmi P (Anna University, India)*

*Mangaiyarkarasi Padmanaaban (Anna University, Tamil Nadu, India)*

**09:30 – 10:00**

**Break**

**10:00 – 11:30**

**4B1: Socio-Technical Systems II**

**Room:** Poinciana AB

**Session Chair:** Holly Handley (Old Dominion University, USA)

**A Cluster Approach for Task Assignment**

*Holly Handley (Old Dominion University, USA)*

**Assessing Complexity for Privacy and Other Quality Attributes Using Actor-Network Theory**

*Stuart Shapiro (MITRE Corporation, USA)*

**Identifying Hidden Risks in Multi-Stakeholder, Dynamic System Development Environments**

*Steven Doskey (MITRE Corporation, USA)*

*Philip Barry (The MITRE Corporation & George Mason University, USA)*

**Why the Build-Versus-Buy Decision is Difficult in Developing Embedded Systems**

*Kim R. Fowler (Campbell University, NC, USA)*

**10:00 – 11:30**

**4B2: INCOSE Track**

**Room:** Poinciana CD

**Interoperability analysis method for mission-oriented system of systems engineering**

*Ronald Giachetti (Naval Postgraduate School, USA)*

*Stefan Wangert (Bundeswehr, Germany)*

*Ross Eldred (Naval Postgraduate School, USA)*

**A Single Change Point Hazard Rate Software Reliability Model with Imperfect Debugging**

*Pooja Rani (NIT Puducherry, India)*

*G S Mahapatra (NIT PUDUHERRY, India)*

**Data Mining-based Techniques in Critical Operation of Electrical Transmission and Distribution Systems in a Natural Disaster Event: Future Direction Review**

*Rossana Villegas (University of Texas at El Paso, USA)*

*Patricia A. Nava (University of Texas at El Paso, USA)*

*Miroslava Barua (University of Texas at El Paso, USA)*

**Operational Needs of Model Centric Engineering**

*Rick Dove (Stevens Institute of Technology)*

*Mark R Blackburn (Stevens Institute of Technology, USA)*



**10:00 – 11:30**

**4B3: Special Session for Aerospace Systems Engineering**

**Room:** Palm ABC

**Session Chair:** Haifeng Zhu

**Modeling Mission Support for Manufactured Systems**

*Haifeng Zhu (UTRC, USA)*

**Complete Mission-Based Integrated Design Method**

*Haifeng Zhu (UTRC, USA)*

**System characteristics of a micro UAV defense system**

*Markus Diehl (Technical University Munich, Germany)*

*Tim Klaproth (Technical University Munich, Germany)*

*Mirko Hornung (Technical University of Munich, Germany)*

**10:00 – 11:30**

**4B4: Robotic and Unmanned Systems III**

**Room:** Palm DEF

**Session Chair:** Christoph Lauer (Audi AG, Germany)

**Scenario-Based Systems Engineering: An Approach Towards Automated Driving Function Development**

*Christoph Sippl (AUDI AG, Germany)*

*Florian Bock (Friedrich-Alexander University & AUDI AG, Germany)*

*Christoph Lauer (Audi AG, Germany)*

*Aaron Heinz (AUDI AG, Germany)*

*Thomas Neumayer (AUDI AG, Germany)*

*Reinhard German (University of Erlangen, Germany)*

**Space-Time Low Complexity Algorithms for Scheduling a Fleet of UAVs in Smart Cities Using Dimensionality Reduction Approaches**

*Ahmed Bahabry (Stevens Institute of Technology, USA)*

*Hakim Ghazzai (Stevens Institute of Technology & Stevens, USA)*

*Gregg Vesonder (Stevens Institute of Technology, USA)*

*Yehia Massoud (Stevens Institute of Technology, USA)*

**Design of Fractional Order Sliding Mode Controller for Semi Active Suspension System**

*Yuvapriya T (Anna University, India)*

*P.Lakshmi (Anna University, India)*

**Leveraging Boids to Implement an Intelligent Swarming Robotic System**

*Kendon Ricketts (Florida Polytechnic University, USA)*

*Jenario Johnson (Florida Polytechnic University, USA)*

*Eric Williams (Florida Polytechnic University, USA)*

*Michael A Swindon (Florida Polytechnic University, USA)*

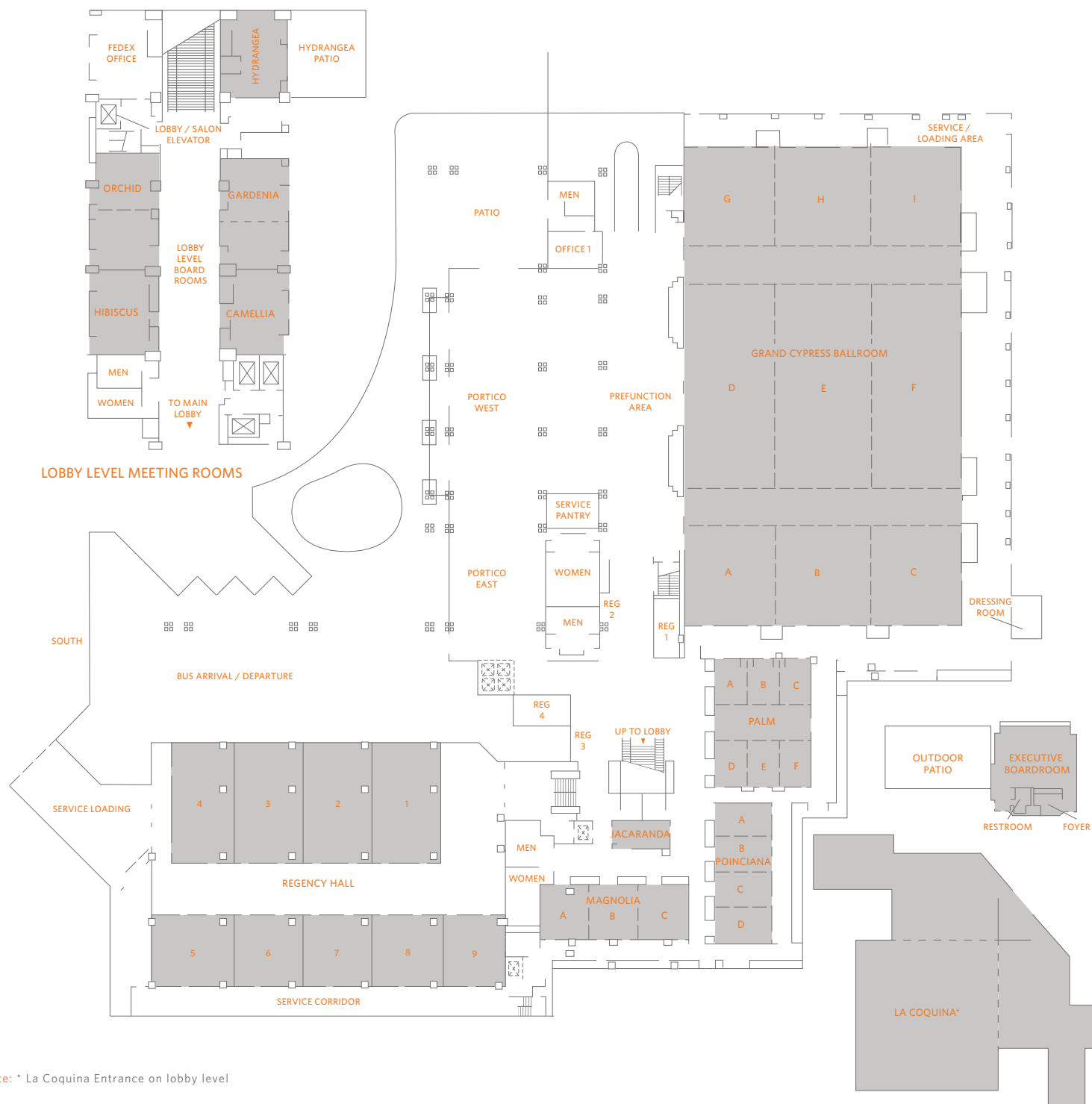
*Ryan Integlia (Florida Polytechnic University, USA)*

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## FLOOR PLAN

Ground Level



Note: \* La Coquina Entrance on lobby level

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