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Program printed on April 12, 2018

Welcome Message

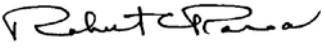
On behalf of the IEEE and officers of the IEEE Systems Council, I would like to extend a warm and cordial welcome to our attendees at the 12th Annual IEEE International Systems Conference here in the wonderfully delightful cosmopolitan city of Vancouver. Among our attendee ranks are engineers and practitioners, academics and researchers, government folks and students from multiple countries around the globe, all with the common interest of systems engineering for complex systems.

We hope that the technical program we have planned for you is what you were anticipating, as it does covering 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.

The ever-increasing complexity of the systems we design and develop for the benefit of the world and its population are putting increasing demands on those who practice the art of systems engineering, especially those with experience and focus on complex systems. These systems are costly to develop and take years, even decades, to fully execute – so we cannot afford mistakes or false starts or errors in execution. We need to build the right systems, and we need to build these systems right. These systems also need to be both practical as well as feasible, and to accomplish these goals we need more and more experienced systems engineers. This conference is intended to provide the kind of advanced content that our practicing systems engineers, and the educators of those systems engineers, need to help them grow in their knowledge and experience.

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 Vancouver, at this beautiful new luxury hotel, where there are many sights to see (in the evenings, of course!) 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 13th Annual International Systems Conference will be in Orlando Florida, on April 8-11, 2019, at the delightful Hyatt Grand Cypress hotel.



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

Conference Committee

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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

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Keynote Speaker

Tuesday, April 24, 8:15 AM – 9:30 AM
Kitsilano Ballroom D
Jackson Klein
Lumerical Inc, Vancouver, BC, Canada
Senior R&D Manager, Optical Systems and Circuits

Title: Silicon Photonics Design: From Devices to Systems

Bio:

Jackson Klein received the B.Sc. degree in electrical engineering from the Federal University of Santa Maria, Brazil, in 1993, and the M.Sc. and Ph.D. degrees in electrical engineering, in 1995 and 1999, respectively, from UNICAMP, Brazil, and the M.B.A. degree from the University of Ottawa, ON, Canada.

He has been working with design and development of computer-aided design and analysis tools for optical communication systems and photonic integrated circuits for almost 20 years. He joined Optiwave's research and development group after receiving his Ph.D. as the main researcher and designer of OptiSystem and OptiSPICE technologies. In 2011 He joined Lumerical where he leads the R&D team responsible for INTERCONNECT, the leading photonic integrated circuit simulator for silicon photonics. He is the author of over 35 conference papers and technical articles.

Young Professionals Networking Event

Tuesday, April 24, 6:30 PM - 8:30 PM
Fairview IV

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 24, in Fairview IV 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.

Technical Committee Meeting

Tuesday, April 24, 18:30 – 19:00
Analytics and Risk Technical Committee Meeting
Room: Fairview II

All SysCon conference attendees are invited to join for review and planning of the Analytics & Risk Technical Committee activities in 2018-2019. Hosted by Desheng Dash Wu, ARTC Committee Chair, and James H. Lambert, F.ASCE.

The ARTC enables growth and understanding of theory and best practices in analytics and risk. Risk analytics in business intelligence represents data-oriented techniques to supplement business systems for risk-based decision making. Risk performance analysis in manufacturing intelligence uses advanced data analytics, modeling, and simulation to produce a fundamental transformation to new product-based economics through internet-based service enterprises and demand-driven supply chains. Risk evaluation plays key roles in emerging areas such as biomanufacturing, nanotechnology, and energy. There is a dramatic increase in the use of predictive analytics in these and many other areas. The ARTC brings together scientists and engineers from a variety of backgrounds and disciplines, and provides opportunities to discuss these open issues and advance the related interests of the IEEE Systems Council. This brief meeting will update you of upcoming meetings and put you on a path to leadership and success of the IEEE in the topic of analytics and risk.

Tuesday, April 24, 18:30 – 19:00
Social and Economic Security Technical Committee Meeting
Room: Fairview III

The SESTC is a new technical committee initiated within the IEEE SMC Society for researchers, engineers and practitioners interested to promote social and economic security as a research domain. The SESTC supports organization of conferences, special sessions, journal special issues, learning materials, best practices, tutorials, sessions, webinars, and other educational resources. This new TC is involved in international standardization efforts and is a source of professional knowledge on state-of-the-art best practices and trends in social and economic security. The SESTC meeting at the 2018 SysCon promotes membership and growth of this specific TC and knowledgeable about this benefit of IEEE membership. This brief meeting is open to anyone interested in the SES research, development and applications.
Members will be invited to participate in organizing events and to submit papers to selected publications. To join, please attend or otherwise contact Professor Dash Wu (chair) or Professor James H. Lambert (co-chair).

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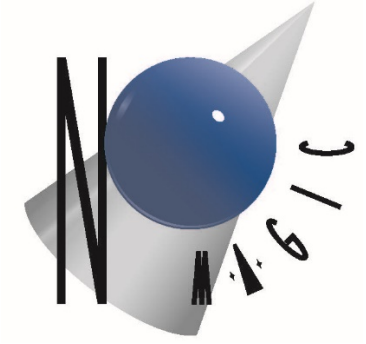

PROGRAM SCHEDULE - Monday, April 23, 2018			
07:00 - 17:00	**REGISTRATION – Kitsilano-Fairview Prefunction**		
Room	**Fairview III**	**Fairview IV**	**Fairview V**
08:00 - 10:00	1A1 – *Tutorial* Fundamentals of Systems Analysis in the New Millennium	1A2 – *Tutorial* Security-Informed System Safety Engineering	
10:00 - 10:15	**BREAK- Kitsilano-Fairview Prefunction**		
10:15 - 12:00	1B1 – *Tutorial* Fundamentals of Systems Analysis in the New Millennium	1B2 – *Tutorial* Security-Informed System Safety Engineering	
12:00 - 13:00	**LUNCH - Kitsilano Ballroom C (Tutorial Attendees Only)**		
13:00 - 15:00	1A1 – *Tutorial* Fundamentals of Systems Analysis in the New Millennium	1C2 – *Tutorial* ISO 26262 Functional Safety for ADAS and Autonomous Vehicles	1C3 – *Tutorial* System Security Engineering Tutorial
15:00 - 15:15	**BREAK- Kitsilano-Fairview Prefunction**		
15:15 - 17:00	1A1 – *Tutorial* Fundamentals of Systems Analysis in the New Millennium	1D2 – *Tutorial* ISO 26262 Functional Safety for ADAS and Autonomous Vehicles	1D3 – *Tutorial* System Security Engineering Tutorial

PROGRAM SCHEDULE - Tuesday, April 24, 2018						
07:00 - 17:00	**REGISTRATION – Kitsilano-Fairview Prefunction**					
08:15 - 09:30	**Keynote Speaker:** Jackson Klein Silicon Photonics Design: From Devices to Systems					
09:30 - 10:00	**BREAK- Kitsilano-Fairview Prefunction**					
10:00 - 12:00	**Executive Plenary Panel:** **SYSTEMS ENGINEERING FOR COMPLEX SYSTEMS - CHALLENGES AND ISSUES** **Moderator:** Bob Rassa, Raytheon **Panelists:** Paul C. Hershey, Raytheon Donna Rhodes, MIT Bob Lyons, Independent Consultant Vincenzo Piuri, University of Milan					
12:00 - 13:30	**LUNCH - Kitsilano Ballroom ABC**					
Room	**Fairview I**	**Fairview II**	**Fairview III**	**Fairview IV**	**Fairview V**	**Stanley**
13:30 - 15:00	2C1: Systems Integration and Verification	2C2: Modeling and Simulation I	2C3: Complex Systems I	2C4: Systems Engineering I	2C5: Autonomous Systems	
15:00 - 15:30	**BREAK- Kitsilano-Fairview Prefunction**					
15:30 - 17:00	2D1: Systems Engineering Education & Theory	2D2: Modeling and Simulation II	2D3: Complex Systems II	2D4: Systems Engineering II	2D5: Special Session on Human System Integration	2D6: Special Session: Applying MBE to Systems of Systems
17:30 - 18:30	**Welcome Reception – Parq Outdoor Terrace, 6th floor**					
18:30 – 20:30	**Young Professionals Networking Event – Fairview IV**					
18:30 – 19:30	**Analytics and Risk Technical Committee Meeting - Fairview II**					
18:30 – 19:30	**Social and Economic Security Technical Committee Meeting - Fairview III**					

PROGRAM SCHEDULE - Wednesday, April 25, 2018					
07:00 - 17:00	**REGISTRATION – Kitsilano-Fairview Prefunction**				
Room	**Fairview I**	**Fairview II**	**Fairview III**	**Fairview IV**	**Fairview V**
08:00 - 09:30	3A1: Machine Learning	3A2: Transportation Systems	3A3: Model-Based Systems Engineering I	3A4: Engineering Systems-of-Systems I	3A5: Sensors I
09:30 - 10:00	**BREAK- Kitsilano-Fairview Prefunction**				
10:00 - 11:30	3B1: Robotic Systems	3B2: Modeling and Simulation III	3B3: Model-Based Systems Engineering II	3B4: Engineering Systems-of-Systems II	3B5: Sensors II
11:30 - 13:00	**Best Paper Awards Luncheon - Kitsilano Ballroom ABC**				
13:00 - 14:30	3D1: Cyber Security I	3D2: Communication Systems I	3D3: Model-Based Systems Engineering III	3D4: Medical Systems	3D5: INCOSE Track
14:30 - 15:00	**BREAK- Kitsilano-Fairview Prefunction**				
15:00 - 16:30	3E1: Cyber Security II	3E2: Communication Systems II	3E3: Model-Based Systems Engineering IV	3E4: Decision-Making for Complex Systems I	3E5: Energy Management and Sustainability

PROGRAM SCHEDULE - Thursday, April 26, 2018			
08:00 - 11:30	**REGISTRATION – Kitsilano-Fairview Prefunction**		
Room	**Fairview I**	**Fairview II**	**Fairview III**
08:00 - 09:30	4A1: System Architecture I	4A2: Systems and Applications	4A3: Decision-Making for Complex Systems II
09:30 - 10:00	**BREAK- Kitsilano-Fairview Prefunction**		
10:00 - 11:30	4B1: System Architecture II	4B2: Cloud Computing	4B3: Decision-Making for Complex Systems III

Monday, April 23

07:00 - 17:00
Registration
Room: Kitsilano-Fairview Prefunction

08:00 - 10:00
1A1: Fundamentals of Systems Analysis in the New Millennium
Room: Fairview III
Presenter: Peter Whitehead

08:00 - 10:00
1A2: Security-Informed System Safety Engineering
Room: Fairview V
Presenters: Jeffrey Joyce and Laurent Fabre

10:00 - 10:15
Break

10:15 – 12:00
1B1: Fundamentals of Systems Analysis in the New Millennium
Room: Fairview III
Presenter: Peter Whitehead

10:15 - 12:00
1B2: Security-Informed System Safety Engineering
Room: Fairview V
Presenters: Jeffrey Joyce and Laurent Fabre

12:00 - 13:00
Lunch – for Tutorial Attendees Only
Room: Kitsilano Ballroom C

13:00 - 15:00
1C1: Fundamentals of Systems Analysis in the New Millennium
Room: Fairview III
Presenters: Peter Whitehead

13:00 - 15:00
1C2: ISO 26262 Functional Safety for ADAS and Autonomous Vehicles Room: Fairview IV
Presenter: Jeffrey Joyce and Simon Diemert

13:00 - 15:00
1C3: System Security Engineering Tutorial
Room: Fairview V
Presenter: Logan Mailloux

15:00 - 15:15
Break

15:15 - 17:00
1D1: Fundamentals of Systems Analysis in the New Millennium
Room: Fairview III
Presenter: Peter Whitehead

15:15 - 17:00
1D2: ISO 26262 Functional Safety for ADAS and Autonomous Vehicles
Room: Fairview IV
Presenter: Jeffrey Joyce and Simon Diemert

15:15 - 17:00
1D3: System Security Engineering
Tutorial Room: Fairview V
Presenters: Logan Mailloux

07:00 - 17:00
Registration
Room: Kitsilano-Fairview Prefunction

08:15 - 09:30
Executive Plenary Panel
Room: Kitsilano Ballroom D

09:30 – 10:00
Coffee Break
Room: Kitsilano-Fairview Prefunction

10:30 - 12:00
Keynote:
Room: Kitsilano-Fairview Prefunction

12:00 - 13:30
Lunch
Room: Kitsilano Ballroom ABC

13:30 - 15:00
2C1: Systems Integration and Verification
Room: Fairview I
Session Chair: Mark Austin (University of Maryland, USA)

Knowledge Management in Data Center Project Lifecycle
Montri Wiboonrat (Faculty of Engineering, Thammasat University, Thailand)

Formal Verification of A Domain Specific Language for Run-time Adaptation
Shahid Khan (National University of Sciences and Technology, Pakistan)
Faiq Khalid (Vienna University of Technology Austria)
Osman Hasan (National University of Sciences and Technology, Pakistan)
Joao M. P. Cardoso (University of Porto, Portugal)

Model-based Validation and Testing of industry 4.0 plants
Thomas Glock (FZI Forschungszentrum Informatik, Germany)
Björn Sillmann (BMW Group AG, Germany)
Max Kobald (FZI Research Center for Information Technology, Germany)
Sebastian Rebmann (FZI Research Center for Information Technology, Germany)
Eric Sax (FZI Research Center for Information Technology, Germany)

Modeling and Cross-Domain Dependability Analysis of Cyber-Physical Systems
Mark Austin (University of Maryland, USA)
Mark R Blackburn (Stevens Institute of Technology, USA)
Maria Coelho (University of Maryland, USA)

13:30 - 15:00
2C2: Modeling and Simulation I
Room: Fairview II
Session Chair: Rabbia Idrees (Lahore University of Management Sciences, Pakistan)

Performance Evaluation of IEEE 1588 Protocol with Modified LibPTP in OMNet++
Rabbia Idrees (Lahore University of Management Sciences, Pakistan)
Irfan Allahi Lahore University of Management Sciences, Pakistan)
Bilal Khan (Lahore University of Management Sciences & COMSATS, Pakistan)
Shahid Masud (Lahore University of Management Sciences, Pakistan)

Availability Models for Hyper-converged Cloud Computing Infrastructures
Carlos Melo (UFPE, Brazil)
Jamilson Dantas (University Federal of Pernambuci & UFPE, Brazil)
Paulo Maciel (Federal University of Pernambuco, Brazil)
Rubens S. Matos, Jr. (Federal Institute of Education, Science, and Technology of Sergipe, Brazil)
Andre Oliveira (Federal University of Pernambuco, Brazil)
Jean Carlos Teixeira de Araujo (Federal University of Pernambuco & Federal Rural University of Pernambuco, Brazil)
Iure Fé (Federal University of Pernambuco, Brazil)
Danilo Oliveira (Federal University of Penambuco,Brazil)

COMFAST: A Comparative Framework for Analysis of Scheduling Techniques in Multi-core Systems
Sarah Shah (National University of Sciences and Technology, Pakistan)
Abdul Qahir (National University of Sciences & Technology, Pakistan)
Masooma Safeer (National University of Sciences and Technology, Pakistan)
Osman Hasan (National University of Sciences and Technology, Pakistan)
Sana Mazahir (National University of Sciences and Technology, Pakistan)

13:30 - 15:00
2C3: Complex Systems I
Room: Fairview III
Session Chair: Cairo L. Nascimento, Jr. (Instituto Tecnológico de Aeronáutica, Brazil)

Robustness of Reconfigurable Complex Systems by a Multi-Agent Simulation: Application on Power Distribution Systems
Michel Bessani (University of São Paulo, Brazil)
Rafael Ribeiro (University of São Paulo, Brazil)
Giuliano Andrea Pagani (University of Groningen, The Netherlands)
Marco Aiello (University of Stuttgart, Germany)
Carlos Maciel (USP, Brazil)

Introducing learning automata to financial portfolio components selection
Elton Sbruzzi (Universidade Federal Fluminense, Brazil)
Michel Leles (UFSJ, Brazil)
Cairo L. Nascimento, Jr. (Instituto Tecnológico de Aeronáutica, Brazil)

A Singular Spectrum Analysis based Trend-Following 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 (Universidade Federal Fluminense, Brazil)
Cairo L. Nascimento, Jr. (Instituto Tecnológico de Aeronáutica, Brazil)
Homero Guimarães (Universidade Federal de Minas Gerais, Brazil)

Automated Human Capital Management System
Axat Chaudhary (School of Engineering and Applied Science, Ahmedabad University, India)
Mayank Jobanputra (School of Engineering and Applied Science, Ahmedabad University, India)
Saumil Shah (School of Engineering and Applied Science, Ahmedabad University, India)
Mayank Jobanputra (School of Engineering and Applied Science, Ahmedabad University, India)
Saumil Shah (School of Engineering and Applied Science, Ahmedabad University, India)
Ratnik Gandhi (Ahmedabad University, India)
Sanjay R Chaudhary (Institute of Engineering and Technology, India)
Raxit Goswami (Hirevalley Inc, India)

13:30 - 15:00
2C4: Systems Engineering I
Room: Fairview IV

Finite Production Run-based Performance Evaluation of Assembly Systems with Bernoulli Machines
Zhiyang Jia (Beijing Institute of Technology, P.R. China)
Chang Liu (Beijing Institute of Technology, P.R. China)
Yan Zhang (Beijing Institute of Technology, P.R. China) Yaping Dai (Beijing Institute of Technology, China)

Formalization of the Responsive and Formal Design Process using Category Theory
Solomon Gebreyohannes (NC A&T University, USA)
William Edmonson (North Carolina A&T State University, USA)
Albert Esterline (North Carolina A&T State University, USA)

The Hic Sunt Dracones of the Systems Engineer
Alberto Sols (University College of South-East Norway, Spain)

Application and refinement of the Early Lifecycle Cost Estimation Model: A case study of the JLTV
Kyle Werner (United States Military Academy at West Point & United States Army, USA)
Christopher Raymond (United States Military Academy at West Point, USA)
Sai Kumar (United States Military Academy at West Point, USA) Alexander Aukerman (United States Military Academy at West Point, USA)
Thomas Ryan, Jr (United States Military Academy & United States Army, USA)
Ricardo Valerdi (University of Arizona, USA)

13:30 - 15:00
2C5: Autonomous Systems
Room: Fairview V
Session Chair: Paul C. Hershey (Raytheon, Inc., USA)

An enhanced advisory system to improve situational awareness and abnormal situation management
Kourosh Parsa (University Of Queensland/ Australia, Australia)
Maureen Hassall (The University of Queensland, Australia)

Common Ground Control System (CGCS) to Support Autonomous Object Observation, Collection, and Response in Multi-Domain Environments
Paul C. Hershey (Raytheon, Inc., USA)
Mike Lewis (Raytheon, USA); Michael Sica (Raytheon IIS, USA)

Range Prediction and Extension for Automated Electric Vehicles with Fail-Operational Powertrain
Kirill Gorelik (Robert Bosch GmbH, Germany)
Ahmet Kilic (Robert Bosch GmbH, Germany)
Roman Obermaisser (University of Siegen, Germany)

15:00 - 15:30
Break

15:30 - 17:00
2D1: Systems Engineering Education & Theory
Room: Fairview I
Session Chair: Cairo L. Nascimento, Jr. (Instituto Tecnológico de Aeronáutica, Brazil

Teaching Systems Thinking: A Case Study at the United States Military Academy
Thomas Ryan, Jr (United States Military Academy & United States Army, USA)
Stephen Gillespie (United States Military Academy & United States Army, USA)
James Schreiner (United States Military Academy & United States Army, USA)

Promoting Innovation Through Systems Thinking and Systems Design
Asad Azemi (Pennsylvania State University, USA)

Training Systems Engineers to Model Sociotechnical Aspects of Complex Engineered Systems
Thomas A McDermott, Jr (Georgia Tech Research Institute & Georgia Tech Sam Nunn School of International Affairs, USA)
Molly Nadolski (Georgia Institute of Technology, USA)

15:30 - 17:00
2D2: Modeling and Simulation II
Room: Fairview II
Session Chair: Joe Cecil (Oklahoma State University & Cyber Tech LLC, USA)

Modeling and Simulation of multi-UAV, multi-Operator Surveillance Systems
James Humann (US Army Research Laboratory, USA)
Eric Spero (US Army Research Laboratory, USA)

Detecting Unintended Consequences in Engineering Systems: What Can We Learn from Multi-scale Modeling?
Joana Cardoso (Stevens Institute of Technology, USA)
Michael Pennock (Stevens Institute of Technology, USA)

Next Generation Cyber Physical Frameworks for Electronics Manufacturing
Rajesh Krishnamurthy (Oklahoma State University, USA)
Joe Cecil (Oklahoma State University & Cyber Tech LLC, USA)

Modeling of a Dynamic Pricing Environment to Enable Success in Complex Adaptive Markets
Pravir Malik (Deep Order Technologies & Zappos, USA)

15:30 - 17:00
2D3: Complex Systems II
Room: Fairview III
Session Chair: Bonnie Johnson (Naval Postgraduate School, USA)

An Attempt to Understand Information Processing Capability in Complex Networks
Aditya Akundi (University of Texas at El Paso, USA)
Eric Smith (University of Texas at El Paso, USA)
Tzu-Liang (Bill) Tseng (University of Texas at El Paso, USA)
Ileana Rubio (The University of Texas at El Paso, USA)

Distributed estimation of both position and orientation for networked systems on the sphere
Byung-Hun Lee (Korea Railroad Research Institute, Korea)
Koog-Hwan Oh (Gwangju Institute of Science and Technology (GIST), Korea)
Takeshi Hatanaka (Tokyo Institute of Technology, Japan)
Hyo-Sung Ahn (Gwangju Institute of Science and Technology (GIST), Korea)

Identification of Tipping Points in Supply Chain Dynamics using Effective Dimension and Resilience Index
Christine Edwards (Lockheed Martin & Stevens Institute of Technology, USA)
Eric Muhle (Lockheed Martin, USA)
Kyle Wolma (Lockheed Martin, USA)
Amber Bishop (University of Colorado, USA)
Roshanak Nilchiani (Stevens Institute, USA)

Towards a Theory of Engineered Complex Adaptive Systems of Systems
Bonnie Johnson (Naval Postgraduate School, USA)

15:30 - 17:00
2D4: Systems Engineering II
Room: Fairview IV
Session Chair: Thomas Glock (FZI Forschungszentrum Informatik, Germany)

Engineering the Information Ecosystem
Steven Doskey (MITRE Corporation, USA)
Philip Barry (The MITRE Corporation & George Mason University, USA)

Exploring LoS in Railway Transportation Systems using SysML
Christos Kotronis, (Harokopio University of Athens, Greece)
Mara Nikolaidou (Harokopio University of Athens, Greece)
Anargyros Tsadimas (Harokopio University of Athens, Greece)
George Dimitrios Kapos (Harokopio University of Athens, Greece)
Dimosthenis Anagnostopoulos (Harokopio University of Athens, Greece)

A game-theoretic framework for concurrent technology roadmap planning using best-response techniques
Ksenia Smirnova (Skolkovo Institute of Science and Technology)
Alessandro Golkar (Skolkovo Institute of Science and Technology, Russia)
Rob Vingerhoeds (ISAE-SUPAERO, France)

15:30 - 17:00
2D5: Special Session on Human System Integration
Room: Fairview V
Session Chair: Holly Handley (Old Dominion University, USA)

User Skills as a Component of Task Complexity
Holly Handley (Old Dominion University, USA)

Revisiting Task Complexity: A Comprehensive Framework
Mahmoud Efatmaneshnik (Australia)
Holly Handley (Old Dominion University, USA)

Using Human-Model Interaction Heuristics to Enable Model-Centric Enterprise Transformation
Donna H. Rhodes (Massachusetts Institute of Technology, USA)

15:30 – 17:00
2D6: Applying MBE to Systems of Systems
Room: Stanley
Session Chair: Garry Roedler

17:00 - 18:30
Reception
Room: Parq Outdoor Terrace, Level 6

18:30-19:30
Analytics and Risk Technical Committee Meeting

18:30-19:30
Social and Economic Security Technical Committee Meeting

18:30 - 20:30
Young Professionals Networking Event
Room: Fairview IV

7:00-17:00
Registration

08:00 - 9:30
3A1: Machine Learning
Room: Fairview I
Session Chair: Youry Khmelevsky (Okanagan College, Canada)

Towards formal methods and software engineering for deep learning
Gaétan J. D. R. Hains (Huawei Technologies Co. Ltd., France)
Youry Khmelevsky (Okanagan College, Canada)

Architecture for Testing Learning-Based Autonomous Vehicle Control Design
Michael Kogan (Royal Military College of Canada, Canada
Peter Travis Jardine (Queen's University, Canada)
Sidney Givigi (Royal Millitary College of Canada, Canada)

An Interactive Architecture for Industrial Scale Prediction: Industry 4.0 Adaptation of Machine Learning
Ritaban Dutta (CSIRO Data61, Australia)

08:00 - 9:30
3A2: Transportation Systems
Room: Fairview II
Session Chair: Huy Tran (University of Illinois at Urbana-Champaign, USA)

Data-driven Resilience Quantification of the US Air Transportation Network
Keshav Ram Chandramouleeswaran (University of Illinois at Urbana-Champaign, USA)
Huy T Tran (University of Illinois at Urbana-Champaign, USA)

Towards an Accessible Dispatch System for Major Events

Nelson King (Khalifa University, United Arab Emirates)
Raja Jayaraman (Khalifa University, United Arab Emirates)
Youssef Iraqi (Khalifa University, United Arab Emirates)
Nawaf Almoosa (Khalifa University, United Arab Emirates)

Factor Analysis of The Decision to Text while Driving in Kuwait
Ahmed Alzanki (University of Southern California, USA)

A Performability Model for the BRT System
Renata Cristine Dantas (Federal University of Pernambuco - UFPE, Brazil)
Jamilson Dantas (University Federal of Pernambuci & UFPE, Brazil)
Carlos Melo (UFPE, Brazil); Paulo Maciel (Federal University of Pernambuco, Brazil)
Gabriel Alves (Federal Rural University of Pernambuco, Brazil)

08:00 - 9:30
3A3: Model-Based Systems Engineering I
Room: Fairview III
Session Chair: Ali Behravan (University of Siegen, Germany)

Automatic Model-Based Fault Detection and Diagnosis Using Diagnostic Directed Acyclic Graph for a Demand-Controlled Ventilation and Heating System in Simulink
Ali Behravan (University of Siegen, Germany)
Roman Obermaisser (University of Siegen, Germany)
Deepak Hanike Basavegowda(University of Siegen, Germany)
Simon Meckel (University of Siegen, Germany)

Increasing the productivity of an MBSE development team throughout the system design lifecycle
Bill Chown (INCOSE & Mentor Graphics, USA)
John Blyler (Portland State University & JB Systems, USA)

Oceade Tidal Turbine Platform and TRIDENT Simulation using MatLab
Catherine Salvador (Mapua University, Philippines)

Mining Most Informative Atomic Patterns from Location-Based Social Media
Victor Liang (The Hong Kong Polytechnic University, Hong Kong)
Vincent Ng (The Hong Kong Polytechnic University, Hong Kong)

08:00 - 9:30
3A4: Engineering Systems-of-Systems I
Room: Fairview IV
Session Chair: Abdulai Kargbo (George Washington University, USA)

An Initial Analysis of Operational Emergent Properties in a Platooning System-of-Systems
Jakob Axelsson (Mälardalen University & Swedish Institute of Computer Science, Sweden)

Towards a Risk Analysis Method for Systems-of-Systems Based on Systems Thinking
Jakob Axelsson (Mälardalen University & Swedish Institute of Computer Science, Sweden)
Avenir Kobetski (Swedish Institute of Computer Science (RISE SICS), Sweden)

Establishing a Framework for Disaster Management System-of-Systems
Chao Fan (Texas A&M University, USA)
Ali Mostafavi (Texas A&M University,USA)

Electric Grid Disaster Response Management - A Systems of Systems Engineering Approach
Abdulai Kargbo (George Washington University, USA)

08:00 - 9:30
3A5: Sensors I
Room: Fairview V
Session Chair: Meaghan Charest (University of New Brunswick, Canada)

Expected Nodes in Target Sensing Area in Wireless Sensor Networks
Khaled Hadi (Kuwait University, Kuwait)

A Radio-fingerprinting-based Vehicle Classification System for Intelligent Traffic Control in Smart Cities
Benjamin Sliwa (TU Dortmund University, Germany)
Marcus Haferkamp (TU Dortmund University, Germany)
Manar Al-Askary (TU Dortmund University, Germany)
Dennis Dorn (Wilhelm Schröder GmbH, Germany)
Christian Wietfeld (TU Dortmund University, Germany)

High Latency Cause Detection using Multilevel Dynamic Analysis
Naser Ezzati (Ecole Polytechnique de Montreal, Canada)
Genevieve Bastien (Polytechnique, Canada)
Michel R. Dagenais (Ecole Polytechnique de Montreal, Canada)

09:30 - 10:00
Coffee Break

10:00 – 11:30
3B1: Robotic Systems
Room: Fairview I
Session Chair: Sidney Givigi (Royal Millitary College of Canada, Canada)

A Modular and Generic Virtual Reality Training Framework for Micro-Robotic Cell Injection Systems
Nabeel Kamal (National University of Sciences and Technology, Pakistan)
Zohaib Amjad Khan (National University of Sciences and Technology, Pakistan)
Asad Hameed (National University of Sciences and Technology, Pakistan)
Osman Hasan (National University of Sciences and Technology, Pakistan)

Comparison Between Fuzzy and Neural Controllers to Cross the Reality Gap in Evolutionary Robotics
Weslley Farias (Federal University of Sergipe, Brazil)
Eduardo O. Freire (Federal University of Sergipe, Brazil)
Sidney Givigi (Royal Millitary College of Canada, Canada)
Elyson A N Carvalho (Federal University of Sergipe, Brazil)
Lucas Molina (Federal University of Sergipe, Brazil)

Monocular Visual Odometry for Robotic Wheelchair in a Virtual Environment
Vinicius B Bastos (University of Campinas, Brazil)
Alan Tavares (Universidade Estadual de Campinas, Brazil)
César Henrique Córdova Quiroz (University of Campinas, Brazil)
Pedro Ramon Mello Silva (University of Campinas & Unicamp, Brazil)
Marcus Lima (University of Campinas, Brazil)
Paulo Kurka (University of Campinas, Brazil)

Velocity and Position Trajectory Tracking Through Sliding Mode Control of Two-Wheeled Self-Balancing Mobile Robot
Lucas Pupek (University of New Brunswick & Intelligent Controls Laboratory, Canada)
Rickey Dubay (University of New Brunswick, Canada)

10:00 – 11:30
3B2: Modeling and Simulation III
Room: Fairview II
Session Chair: Youry Khmelevsky (Okanagan College, Canada)

Current and Future Methodologies of After Action Review in Simulation-based Training
Samer Hanoun (Deakin University, Australia)
Saeid Nahavandi (Deakin University, Australia)

Applying Expectation-Maximization Evaluation on Approximate Optimal Control
Songtao Zhang (University of New Brunswick, Canada)
Rickey Dubay (University of New Brunswick, Canada)

Roof Report from Automatically Generated 3D Building Models By Straight Skeleton Computation
Kenichi Sugihara (Gifu Keizai University, Japan)
Youry Khmelevsky (Okanagan College, Canada)

Aircraft Bleed Valve fault classification using Support Vector Machines and Classification Trees
Henrique Castilho (Embraer, Brazil); Wlamir Vianna (EMBRAER, Brazil)
Cairo L. Nascimento, Jr. (Instituto Tecnológico de Aeronáutica, Brazil)

10:00 – 11:30
3B3: Model-Based Systems Engineering II
Room: Fairview III
Session Chair: Catherine Salvador (Mapua University, Philippines)

Extending MBSE To Address Human-Systems Integration Considerations in the System Life Cycle
Douglas Orellana (University of Southern California, USA)
Azad Madni (University of Southern California, USA)

ETL: A New Temporal Language for the Verification of Cyber-Physical Systems
Daniel Bouskela (EDF, France)
Audrey Jardin (EDF, France)

General Architecture for Data Analysis in Industry 4.0 using SysML and Model Based System Engineering
Marcio Arantes (Senai Innovation Institute for Embedded Systems, Brazil)
Renan Bonnard (Senai Innovation Institute for Embedded Systems, Brazil)
Andre P Mattei (Senai Innovation Institute for Embedded Systems, Brazil)
Pierre de Saqui-Sannes (ISAE-SUPAERO, France)

Employing the Model Based Systems Engineering Methodologies to Develop a Domain Specific Language for Contracting of Infrastructure Projects
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)

10:00 – 11:30
3B4: Engineering Systems-of-Systems II
Room: Fairview IV
Session Chair: Jakob Axelsson (Mälardalen University, Sweden)

A Multi-Objective Optimization Approach for Analysing and Architecting System of Systems At the Example of an Electric Vehicle Integration into a Smart Home Environment
Björn Sillmann (BMW Group AG, Germany)
Raziyeh Ghassemi (BMW Group AG, Germany)

A Conceptual Framework for Supporting UAV based Cyber Physical Weather Monitoring Activities
Joe Cecil (Oklahoma State University & Cyber Tech LLC, USA)

On Functional Safety Methods: A System of Systems Approach
Arash Khabbaz Saberi (Eindhoven University of Technology, The Netherlands)
Eric Barbier (Ricardo, United Kingdom (Great Britain))
Frank Benders (TNO, The Netherlands)
Mark van den Brand (Eindhoven University of Technology, Netherlands, The Netherlands)

UAS Trajectory Scheduling System
Mihaela Cardei (Florida Atlantic University, USA)
Ionut Cardei (Florida Atlantic University, USA)
Andrew Steinberg (Florida Atlantic University, USA)

10:00 – 11:30
3B5: Sensors II
Room: Fairview V
Session Chair: TBD

Localization of Specific Body Part by Multiple Depth Sensors Network
Nasreen Mohsin (Simon Fraser University, Canada)
Shahram Payandeh (Simon Fraser University, Canada)

A novel human posture estimation using single depth image from Kinect v2 sensor
Maryamsadat Rasoulidanesh (Simon Fraser University, Canada)
Shahram Payandeh (Simon Fraser University, Canada)

A Classifier Approach to Multi-Screen Switching Based on Low Cost Eye-Trackers
Julie Iskander (Deakin University, Australia)
Imali Hettiarachchi (Deakin University, Australia)
Samer Hanoun (Deakin University, Australia)
Mohammed Hossny (Institute for Intelligent Systems Research and Innovation (IISRI), Australia)
Saeid Nahavandi Deakin University, Australia)
Asim Bhatti (Deakin University, Australia)

Eye Behaviour as a Hazard Perception Measure
Julie Iskander (Deakin University, Australia)
Samer Hanoun (Deakin University, Australia)
Imali Hettiarachchi (Deakin University, Australia)
Mohammed Hossny (Institute for Intelligent Systems Research and Innovation (IISRI) Australia)
Khaled Saleh (Deakin University, Australia)
Hailing Zhou (Centre for Intelligent Systems and Research, Deakin University, Australia)
Saeid Nahavandii (Deakin University, Australia)
Asim Bhatti (Deakin University, Australia)

11:30 – 13:00
Best Paper Awards Luncheon
Room: Kitsilano Ballroom ABC

13:00 – 14:30
3D1: Cyber Security I
Room: Fairview I
Session Chair: Logan Mailloux (Air Force Institute of Technology & United States Air Force, USA)

Examination of Security Design Principles from NIST SP 800-160
Logan Mailloux (Air Force Institute of Technology & United States Air Force, USA)
Paul Beach and Martin Span (Air Force Institute of Technology, USA)

A Model-Based Approach to Security Analysis for Cyber-Physical Systems
Georgios Bakirtzis (Virginia Commonwealth University, USA)
Bryan Carter (University of Virginia, USA)
Carl Elks (Virginia Commonwealth University, USA)
Cody Fleming (University of Virginia, USA)

ORGODEX: Authorization as a Service (AaaS)
Aaron Elliott (Royal Military College of Canada, Canada)
Scott Knight (RMC, Canada)

Impact of a DDoS Attack on Computer Systems: An Approach Based on an Attack Tree Model
Ronierison Maciel (University Federal of Pernambuco, Brazil)
Jean Carlos Teixeira de Araujo (Federal University of Pernambuco & Federal Rural University of Pernambuco, Brazil)
Jamilson Dantas (University Federal of Pernambuci & UFPE, Brazil)
Carlos Melo (UFPE, Brazil)
Erico Guedes (Federal Institute of Education, Science and Technology of Alagoas & Federal University of Pernambuco, Brazil)
Paulo Maciel (Federal University of Pernambuco, Brazil)

13:00 – 14:30
3D2: Communication Systems I
Room: Fairview II
Session Chair: TBD

In the Design of Tactical Communication Systems
Mu-Cheng Wang (Raytheon SAS, USA); Yi-Chao Simon Chuang (Raytheon, USA)
Steven A Davidson (Raytheon Company, USA)
Benyuan Liu (University of Massachusetts Lowell, USA)

Traffic Adaptive Base Station Sleeping Control in Inhomogeneous Network
Juwo Yang (Beijing University of Posts and Telecommunications (BUPT) P.R. China)
Xing Zhang (Beijing University of Posts and Telecommunications, P.R. China)
Wenbo Wang (Beijing University of Posts and Telecommunications, P.R. China)

Wide-Area Lustre File System Using LNet Routers
Nageswara Rao Jesse Hanley (Oak Ridge National Laboratory, USA)
Sarp Oral (Oak Ridge National Lab, USA)
Neena Imam (Oak Ridge National Laboratory, USA)
Jesse Hanley (Oak Ridge National Laboratory, USA)

Design and Hardware implementation of the Code and Carrier Tracking block for an Inter-operable GNSS Receiver
Rabbia Idrees (Lahore University of Management Sciences, Pakistan)
Shahzad Ahmad Butt (Politecnico di Torino, Italy)

13:00 – 14:30
3D3: Model-Based Systems Engineering III
Room: Fairview III
Session Chair: William Edmonson (North Carolina A&T State University, USA)

Optimization of Systems With Nested Design Space
Armin Zimmermann (Ilmenau University of Technology & Systems and Software Engineering, Germany)
Ralph Maschotta (Ilmenau University of Technology, Germany)
Alexander Wichmann (Technische Universität Ilmenau, Germany)
Robert Hilbrich (German Aerospace Center (DLR), Germany)

Systems Engineering Approach for the Conjoint Design of Mechatronic Products and Their Manufacturing Systems
Faïda Mhenni (SUPMECA & Laboratoire Quartz, France)
Olivia Penas (SUPMECA & Laboratoire Quartz EA 7393, France)
Moncef Hammadi (SUPMECA & Laboratoire Quartz EA 7393, France)
Jean-Yves Choley (SUPMECA, France)
Peter Hehenberger (University of Applied Sciences Upper Austria, Austria)

Two-dimensional Pareto frontier forecasting for technology planning and roadmapping
Ilya Yuskevich (Skolkovo Institute of Scinece and Technology, Russia)
Rob Vingerhoeds (ISAE-SUPAERO, France)
Alessandro Golkar (Skolkovo Institute of Science and Technology, Russia)

An MBSE Conceptual Design Phase Model for Inter-Satellite Communication
Awele AnyanHun (North Carolina A&T State University, USA)
William Edmonson (North Carolina A&T State University, USA)

13:00 – 14:30
3D4: Medical Systems
Room: Fairview IV
Session Chair: Joe Cecil (Oklahoma State University & Cyber Tech LLC, USA)

A Contactless System for Continuous Vital Sign Monitoring in Palliative and Intensive Care
Kilin Shi (Friedrich-Alexander University Erlangen-Nuremberg, Germany)
Christoph Will (University of Erlangen-Nuremberg, Germany)
Tobias Steigleder (University Hospital Erlangen, Germany)
Fabian Michler (University of Erlangen-Nuremberg, Germany)
Robert Weigel (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany)
Christoph Ostgathe (University Hospital Erlangen, Germany)
Alexander Koelpin (BTU & Chair for Electronics and Sensor Systems, Germany)

Integration of Traditional Therapy and Systems Approach to Somatic Balance Restoration and Pain Alleviation of Musculoskeletal System
Yoshiaki Ohkami (Keio University, Japan)
Michael Kayo (Keio University, Canada)

Design of VR based Orthopedic Simulation Environments using Emerging Technologies
Joe Cecil (Oklahoma State University & Cyber Tech LLC, USA)
Avinash Gupta (Oklahoma State University, USA)
Miguel Pirela-Cruz (Texas Tech Health Sciences Center, USA)

13:00 – 14:30
3D5: INCOSE Track
Room: Fairview V
Session Chair: Angela Robinson (INCOSE, USA)

A concurrent design approach for model-based technology roadmapping
Dominik Knoll (Skolkovo Institute of Science and Technology, Russia)
Alessandro Golkar (Skolkovo Institute of Science and Technology, Russia)
Olivier de Weck (Massachusetts Institute of Technology, USA)

Overview of an Emerging Standard on Architecture Processes - ISO/IEC/IEEE 42020
James N Martin (The Aerospace Corporation, USA)

Very Small Entities; The Final Systems Engineering (SE) Frontier
Angela Robinson (INCOSE & Very Small Entity Working Group, USA)

INCOSE SE Handbook v3.2 and v4.0 Analysis of Context Diagrams Set
Aditya Akundi (University of Texas at El Paso, USA)
Eric Smith (University of Texas at El Paso, USA)
Tzu-Liang (Bill) Tseng (University of Texas at El Paso, USA)
Ileana Rubio (The University of Texas at El Paso, USA)

14:30 – 15:00
Coffee Break

15:00 – 16:30
3E1: Cyber Security II
Room: Fairview I
Session Chair: Trevor Semeniuk (Strategic J4 Requirements, Canada)

A Systematic Approach of Feature Selection for Encrypted Network Traffic Classification
D. McGaughey (Royal Military College, Canada)

Trevor Semeniuk (Strategic J4 *Requirements, Canada)*
Ron Smith (Royal Military College of Canada, Canada)
Scott Knight (RMC, Canada)

A Systems Approach for Eliciting Mission-Centric Security Requirements
Bryan Carter (University of Virginia, USA)
Georgios Bakirtzis and Carl Elks (Virginia Commonwealth University, USA)
Cody Fleming (University of Virginia, USA)

Authentication Pedigree Scheme for Supply Chain
Manki Min (Louisiana Tech University, USA)
Sunho Lim (Texas Tech University, USA)
Yi Liu (South Dakota State University, USA)
Hyeun Joong Yoon (South Dakota State University, USA)

15:00 – 16:30
3E2: Communication Systems II
Room: Fairview II
Session Chair: Keith Hermiston (Defence Science and Technology Laboratory, United Kingdom (Great Britain))

Selective Dwell Frequency Hopping Using Quasigroups
Keith Hermiston (Defence Science and Technology Laboratory, United Kingdom (Great Britain))

Space-Time ICI Conjugate Cancellation Techniques for OFDMA Downlink in Mobile Fading Channels
Hen-Geul Yeh (California State University Long Beach, USA)

15:00 – 16:30
3E3: Model-Based Systems Engineering IV
Room: Fairview III
Session Chair: Cairo L. Nascimento, Jr. (Instituto Tecnológico de Aeronáutica, Brazil)

Out-of-Sample Mapping of a Two-Link Robotic Manipulator
Ryan Finn (University of New Brunswick, Canada)
Rickey Dubay (University of New Brunswick, Canada)

A Robust Adaptive Control Scheme for Under-Actuated Non-Linear Systems
Edward Parrott (University of New Brunswick, Canada)
Rickey Dubay (University of New Brunswick, Canada)

Research on the Influence and Measurement of Harmonic in Power Supply System for Super Capacitor Tram
Pengyi Liao (Wuhan University, P.R. China)
Yong Chang (Wuhan University, P.R. China)

15:00 – 16:30
3E4: Decision-Making for Complex Systems I
Room: Fairview IV
Session Chair: Philip Barry (The MITRE Corporation, USA)

The Effects of Demand Elasticity and Selling Price Decisions on the Value of Information
Maximilian Zellner (University of Southern California, USA)
Ali Abbas (University of Southern California, USA)

Economic assessment of virtual validation processes in the automotive development - an analytical approach
Max Stanglmeier (BMW AG, Germany)
Michael Schenk (Otto-von-Guericke-Universität Magdeburg, Germany)
Christoph Schäfer (BMW AG, Germany)
Robert Wandt (BMW AG, Germany)

System complexity leadership: The relationship between emotion and decision-making
Leonie Hallo, Indra Gunawan (The University of Adelaide, Australia)
Tiep Nguyen (The University of Adelaide, Australia)

Remote and Dynamic Assessment of Reliability in Electromechanical Actuator Systems
James Cale (Colorado State University, USA)
Miles Brim (Woodward, Inc., USA)

15:00 – 16:30
3E5: Energy Management and Sustainability
Room: Fairview V
Session Chair: Armin Zimmermann (Ilmenau University of Technology, Germany)

Strategic Energy Management in Industry 4.0 Environment
Tallal Javied (Friedrich-Alexander-University of Erlangen- Nuremberg, Germany)
Jupiter Bakakeu Friedrich-Alexander-University of Erlangen- Nuremberg, Germany)
Dennis Gessinger Friedrich-Alexander-University of Erlangen- Nuremberg, Germany)
Joerg Franke (FAPS, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany)

Power Conditioning System with Seamless Mode Transition for Microgrid Island Operations
Sewan Heo (Electronics and Telecommunications Research Institute, Korea)
Jinsoo Han (ETRI, Korea)
Wan-Ki Park (ETRI, Korea)

Model Based Systems Engineering High Level Design of a Sustainable Electric Charging Swapping Station Using Discrete Event Simulation
Obinna Ginigeme (Florida Institute of Technology, USA)
Aldo Fabregas (Florida Institute of Technology, USA)
Troy Nguyen (Florida Institute of Technology, USA)

08:00-11:30
Registration

08:00 – 09:30
4A1: System Architecture I
Room: Fairview I
Session Chair: Dominik Knoll (Skolkovo Institute of Science and Technology, Russia)

Quantifying System Structural Complexity using Design Structure Matrices
Aditya Akundi, (University of Texas at El Paso, USA)
Eric Smith (University of Texas at El Paso, USA)
Tzu-Liang (Bill) Tseng (University of Texas at El Paso, USA)
Ileana Rubio (The University of Texas at El Paso, USA)

Mechatronic System Design with Manufacturing Constraints using Set-Based Concurrent Engineering
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)

A Complete System Architectural Case Study: Open-Source Puppet
Ryan Gauthier (Embry-Riddle Aeronautical University, USA)
Shafagh Jafer (Embry-Riddle Aeronautcial University, USA)

08:00 – 09:30
4A2: Systems and Applications
Room: Fairview II
Session Chair: Neusa Maria F. Oliveira (Instituto Tecnologico de Aeronautica, Brazil)

Systems Analysis of EV Adoption and Criteria Pollutant Accumulation during Inversion Events
Carsten Christensen (Brigham Young University, USA)
Landon Willey (Brigham Young University, USA)
Derek Vasquez (Brigham Young University, USA)
John Salmon (Brigham Young University,USA)

Real-time Face Recognition in HD Videos: Algorithms and Framework
Mayank Jobanputra (School of Engineering and Applied Science, Ahmedabad University, India)
Axat Chaudhary (School of Engineering and Applied Science, Ahmedabad University, India)
Saumil Shah (School of Engineering and Applied Science, Ahmedabad University, India)
Ratnik Gandhi (Ahmedabad University, India)

Autonomous long-range navigation in GNSS-denied environment with low-cost UAV platform
Andre Kuroswiski (Instituto Tecnologico de Aeronautica, Brazil)
Neusa Maria F. Oliveira (Instituto Tecnologico de Aeronautica, Brazil)
Elcio Hideiti Shiguemori (Instituto de Estudos Avançados - IEAv,Brazil)

08:00 – 09:30
4A3: Decision-Making for Complex Systems II
Room: Fairview III
Session Chair: Cairo L. Nascimento, Jr. (Instituto Tecnológico de Aeronáutica,Brazil)

Multi-Objective Job Shop Scheduling Using i-NSGA-III

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)

Concurrent and Geometry-Dependent Selection of Material and Joining Technology - An Initial Utility-Based Systematic Decision-Making Tool
Jerome Kaspar (Saarland University, Germany)
Saphir Choudry (Chemnitz University of Technology, Germany)
Dirk Landgrebe (Chemnitz University of Technology, Germany)
Michael Vielhaber (Saarland University, Germany)

Prioritization of maintenance equipment employing multicriteria decision aid
Taina Mendonca (Univerisidade Federal Fluminense, Brazil)
Luis Alberto Rangel (Universidade Federal Fluminense, Brazil)
Elton Sbruzzi (Universidade Federal Fluminense, Brazil)
Cairo L. Nascimento, Jr. (Instituto Tecnológico de Aeronáutica, Brazil)

Application of Objective Criteria Saturation to Select Best Value Alternative from Fuzzy Requirements
Wesley Gunnar White (Colorado State University, USA)
V. Chandrasekar (Colorado State University, USA)

09:30 – 10:00
Coffee Break

10:00 – 11:30
4B1: System Architecture II
Room: Fairview I
Session Chair: Thomas A McDermott, Jr (Georgia Tech Research Institute & Georgia Tech Sam Nunn School of International Affairs,USA)

ATA: Architecture-based Technology Advisor for Functional Application Domains
Shruti Kunde (Tata Consultancy Services Limited, India)
Chetan Phalak (Tata Consultancy Services, India)
Rekha Singhal (TCS, India)
Manoj Nambiar (Tata Consultancy Services & Institute of Electrical and Electronics Engineers, India)

Art and Architecture: Effectively Communicating Models of Systems
Thomas A McDermott, Jr (Georgia Tech Research Institute & Georgia Tech Sam Nunn School of International Affairs, USA)
Alejandro Salado (Virginia Tech, USA)

Verification and Validation of the Consistency between Multi-Domain System Models
Sarra Missaoui (Supmeca, France)
Faïda Mhenni (SUPMECA & Laboratoire Quartz, France)
Jean-Yves Choley (SUPMECA, France)
Nga Thi Viet Nguyen (EISTI & Quartz, France)

10:00 – 11:30
4B2: Cloud Computing
Room: Fairview II
Session Chair: Aaron Elliott (Royal Military College of Canada, Canada)

Designing and Evaluating Hybrid Storage for High Performance Cloud Computing
Swanand Mhalagi (University of Texas at San Antonio & Open Cloud Institute at UTSA, USA)
Lide Duan (University of Texas at San Antonio, USA)
Paul Rad (Universiity of Texas at San Antonio, USA)

Optimized resource allocation in edge-cloud environment
Njakarison Menja Randriamasinoro (Ecole de Technologie Superieure, Canada & Ecole Supérieure Polytechnique d'Antsiranana, Madagascar)
Kim Khoa Nguyen (Ecole de technologie superieure, University of Quebec, Canada)
Mohamed Cheriet (Ecole de technologie superieure (University of Quebec), Canada)

VM Processes State Detection by Hypervisor Tracing
Hani Nemati (Polytechnique Montreal, Canada)
Michel R. Dagenais (Ecole Polytechnique de Montreal, Canada)

10:00 – 11:30
4B3: Decision-Making for Complex Systems III
Room: Fairview III
Session Chair: Ryan Finn (University of New Brunswick, Canada)

System-in-the-loop Design Space Exploration for Efficient Communication in Large-scale IoT-based Warehouse Systems
Robert Falkenberg (TU Dortmund University, Germany)
Jens Drenhaus(TU Dortmund University, Germany)
Benjamin Sliwa (TU Dortmund University, Germany)
Christian Wietfeld (TU Dortmund University, Germany)

Exploring Empirical Semantic Comparison Assistance
Haifeng Zhu (UTRC, USA)

Integration of Artificial Intelligence in an Injection Molding process for on-line process parameter adjustment
Meaghan Charest (University of New Brunswick, Canada)
Ryan Finn (University of New Brunswick, Canada)
Rickey Dubay (University of New Brunswick, Canada)

Floor Plan


FAIRVIEW BALLROOM
V
IV
III
II
I
FAIRVIEW TERRACE
PREFUNCTION AREA
A
B
C
D
KITSILANO BALLROOM
M
W
MEETING PODS
A
B
C
D
E
PREFUNCTION AREA
PARQ GRAND BALLROOM
A
B
C
D
E
F
COAT CHECK
M
W
BURRARD
GRANVILLE
II
I
OAK
ELM
CAMBIE
STANLEY
ASH