SYSCON 2026

The 20th Annual IEEE International Systems Conference

April 6 - April 9, 2026

Halifax Marriott Harbourfront Hotel

Halifax, Canada

THE 20TH ANNUAL IEEE INTERNATIONAL SYSTEMS CONFERENCE

CONFERENCE PROGRAM

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Welcome Message

On behalf of IEEE and the IEEE Systems Council, it is my pleasure to welcome you to the 20th Annual IEEE International Systems Conference (SysCon 2026) in the vibrant coastal city of Halifax, Nova Scotia, Canada. We are pleased to bring together a diverse community of professionals from industry, government, and academia to share ideas and advance the field of systems engineering and complex systems.

This year's technical program highlights important challenges and emerging innovations in complex systems, systems of systems, and the methodologies that support them. I would like to extend my sincere appreciation to our Technical Program Chair, Dr. Richard Evans of Dalhousie University, for his leadership in developing an excellent program. Please join me in thanking him for his dedication. I also thank our keynote speakers for their valuable contributions and for joining us in Halifax.

As systems continue to grow in complexity – spanning large-scale physical infrastructures and increasingly integrated cyber-physical environments – the importance of sound systems engineering remains paramount. In the face of evolving cybersecurity risks and economic pressures, our work is essential to ensuring the reliability, security, and efficiency of the systems that underpin modern society.

We hope you find SysCon 2026 both intellectually engaging and professionally rewarding. We also encourage you to take time to experience Halifax's rich maritime heritage and welcoming atmosphere. Our team is committed to supporting you throughout the conference – please do not hesitate to reach out if we can assist in any way.

Looking ahead, we are pleased to announce that the 21st Annual IEEE International Systems Conference will be held in April 2027 in Vancouver, British Columbia. We look forward to continuing the conversation there.

Sidney Givigi
SysCon 2026 General Chair

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Leone Young, Stevens Institute of Technology
Zhiyi Yue, Uthealth
Jun Zheng, New Mexico Institute of Mining and Technology
Haifeng Zhu, BAE Systems
Yonghao Zhu, Google Deepmind

Keynote Speakers

Jason Gu
Dalhousie University

Robotics and Artificial Intelligence: Some Perspectives

Tuesday, April 7

The talk will focus on the development of key technology of intelligent robotics and artificial intelligence. Brief history of AI and robotics development will be covered and then key technical issues and development status of robots around perception, decision-making and execution will be discussed in detail, finally some thoughts on AI technology for robotics including adaptive algorithm, big data in robots and novel computing architecture will be put forward.

Nur Zincir-Heywood
Dalhousie University

Dependable and Secure Systems

Wednesday, April 8

Cyber technologies are not only the fastest growing areas but also provide endless possibilities in many different disciplines including dependable and secure systems, networks, and services. Any user who has security cameras, health monitors, or wearables can tangibly experience advances in AI enabling automation and remote monitoring. While AI and systems thinking are merging to create more efficient and effective systems, opportunities and challenges include ensuring the security, trustworthiness and dependability of highly complex, AI-driven decisions. The goal of this talk is to share practical insights while exploring the opportunities and challenges of dependable and secure systems from monitoring to operations to analysis of data in the era of highly connected devices.

Tutorials

All tutorials will be held on Monday, April 6.

1. **From Research to Meaning: A Socio-Technical Approach to Data and Strategic Storytelling for Researchers and Industry Experts**

Opeoluwa Iwashokun, University of Johannesburg

Room: Acadia A
8:00 AM - 10:00 AM

*The presenter will be remote.

A story doesn't just tell words; it connects them and conveys the meaning to the read/listening audience. Technology and people's interaction with it depend on an understanding of how technical designs fit together harmoniously, rather than just integrating people into new tech. Research and innovations may risk effective communication to their audience. This tutorial will demonstrate how research studies can be expressed as data stories, not just technical artefacts, but as human-centered communication systems embedded in social contexts.

2. **System Architecture Optimization with Capella and ADORE**

Santiago Valencia-Ibáñez, Concordia University

Jasper Bussemaker, DLR Institute of System Architectures

Room: Acadia B
8:00 AM - 12:00 PM

System Architecture Optimization (SAO) applies numerical optimization algorithms to the generation and evaluation of system architectures. As systems such as aircraft and land vehicles grow in complexity and adopt novel technologies, it becomes essential to systematically explore architectural design spaces without relying on domain-specific heuristics that may introduce bias and limit innovation. SAO moves optimization methods—traditionally applied downstream after a small number of architectures are selected—into the upstream architecture decision-making process.

By leveraging system architecting activities such as functional decomposition and function-to-component allocation, SAO enables integration between Model-Based Systems Engineering (MBSE) descriptive models and quantitative, simulation-based evaluation and optimization. As a result, SAO bridges conceptual design and architecting with downstream sizing and optimization while enriching MBSE models with data from disciplinary analyses.

This tutorial introduces the theoretical foundations of SAO and provides hands-on experience in modeling architecture design spaces, coupling architecture generation with evaluation code, selecting appropriate optimization algorithms, and integrating SAO with Capella, an open-source MBSE platform.

3. Engineering Trustworthy Secure Systems

Mark Winstead, Cal Tech

Room: Acadia C
8:00 AM - 12:00 PM

The tutorial will address assurance and control as the means to achieve secure system function over tactical threat response. As systems become more complex, the strategic approach re: assurance is needed to gain advantage, an approach only the systems engineer or those practicing systems engineer may hope to achieve.

4. Systems Security Engineering for Trustworthy Systems

Mehrdad S. Sharbaf, Sharbaf and Associates LLC

Room: Acadia A
1:00 PM - 5:00 PM

*The presenter will be remote.

As today's systems become increasingly complex and interconnected, traditional, reactive security approaches are no longer sufficient. Security must be engineered into systems from the beginning - not added after deployment - to address sophisticated adversarial threats and meet certification, accreditation, and trust requirements.

This tutorial introduces Systems Security Engineering (SSE), as defined in DoDI 5200.44 and NIST SP 800-160. SSE integrates security directly into the systems engineering life cycle, applying rigorous engineering principles to identify vulnerabilities, reduce risk, and build resilient, trustworthy systems.

Participants will gain a system-level and management-level understanding of information security, including how security requirements are derived, how they are integrated into system design and development, and how security is managed across the system life cycle. The session balances technical foundations with organizational and compliance considerations, equipping attendees to align security with mission objectives.

By the end of the tutorial, participants will be better prepared to contribute to secure system development and to advocate for security as a core engineering discipline in the face of evolving threats.

5. **Predictive RGBD Simultaneous Localization and Mapping (SLAM) Systems for Robotics and Intelligent Vehicles**

Henry Leung, University of Calgary

Room: Acadia B

1:00 PM - 5:00 PM

3D perception, the ability to perceive depth and spatial relationships in the world, is fundamental to human cognition and holds immense potential across various sensing domains, including robotics and intelligent vehicles. The emergence of deep learning–based techniques offers a compelling alternative, potentially enabling 3D vision from monocular camera inputs without additional hardware modifications. This tutorial will delve into the principles and applications of traditional 3D sensing and computer vision methods for intelligent vehicles. It will then introduce predictive 3D sensing based on deep learning, covering fundamental concepts, common architectures, and training data requirements. Simultaneous localization and mapping (SLAM) and autonomous driving will be used as illustrative examples. Issues such as compatibility with monocular cameras and seamless integration into existing sensor systems without requiring additional hardware modifications will also be discussed.

6. **Adaptive System Design Tutorial**

William Brooks, Boeing

Kirk Moen, Boeing

Room: Acadia C
1:00 PM - 5:00 PM

*The presenter will be remote, but there will be an in-person facilitator.

Complex systems must often evolve over time to address new requirements, technologies, and operating conditions. Designing for adaptability requires balancing current system needs with potential future changes. This tutorial introduces key concepts and theory behind system adaptability and reviews current work in the field.

Building on the introductory tutorial presented in 2025, this session emphasizes hands-on learning. Participants will actively apply adaptive system design methods using a starting model based on the INCOSE CubeSat Reference Model (CSRM). Through guided exercises, attendees will explore the three fundamental factors of adaptive system design: Mission and Requirements Space (MRES), Design Space, and Switching Cost. Using these concepts, participants will evaluate alternatives and develop a recommended design path.

The tutorial is intended for participants of all experience levels. Prior knowledge of Model-Based Systems Engineering (MBSE) may be helpful but is not required, as exercises will be completed individually or in small groups.

Social Events

Welcome Reception

When: Tuesday, April 7, 18:00 – 19:30

Room: Nova Scotia Foyer

Hors d'oeuvres and drinks will be served.

Young Professionals Panel

When: Tuesday, April 7, 19:30 – 21:00

Room: Annapolis

WiSE Networking Reception

When: Wednesday, April 8, 18:00 – 19:30

Room: Sable

WiSE is an affinity group of the IEEE Women in Engineering (WIE), a global network of IEEE members and volunteers dedicated to promoting women engineers and scientists, and inspiring girls around the world to follow their academic interests in a career in engineering and science. Come and meet our WiSE women in person!

Pre-registration is FREE but required.

Conference Sponsors

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Caltech Center for Technology & Management Education

Caltech's Center for Technology and Management Education (Caltech CTME) delivers professional education for engineers and technical leaders operating at the forefront of complex systems. For the IEEE systems engineering community, we offer both public certificate programs and customized organizational engagements designed to strengthen mission-critical capabilities. Our systems engineering portfolio includes INCOSE Academic Equivalency–recognized programs aligned with SEP certification pathways, advanced coursework in Model-Based Systems Engineering (MBSE) using SysML v2, and specialized offerings in Secure Systems Engineering for resilient, high-assurance environments. Whether you are pursuing individual learning or scaling systems engineering excellence across your enterprise, Caltech CTME emphasizes rigorous, application-driven learning grounded in real-world engineering challenges.

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PROGRAM SCHEDULE - Monday, April 6, 2026			
7:00 – 17:00	**REGISTRATION (Coat Check)**		
Room	**Acadia A**	**Acadia B**	**Acadia C**
7:00 – 8:00	**BREAKFAST - Annapolis**		
8:00 – 10:00	1A: Tutorial: From Research to Meaning: A Socio-Technical Approach to Data and Strategic Storytelling for Researchers and Industry Experts	1B: Tutorial: System Architecture Optimization with Capella and ADORE (Part 1)	1C: Tutorial: Engineering Trustworthy Secure Systems (Part 1)
10:00 – 10:30	**BREAK**		
10:30 – 12:00		1B: Tutorial: System Architecture Optimization with Capella and ADORE (Part 2)	1C: Tutorial: Engineering Trustworthy Secure Systems (Part 2)
12:00 – 13:00	**LUNCH - Annapolis**		
13:00 – 15:00	2A: Tutorial: Systems Security Engineering for Trustworthy Systems (Remote) (Part 1)	2B: Tutorial: Predictive RGBD Simultaneous Localization and Mapping (SLAM) Systems for Robotics and Intelligent Vehicles (Part 1)	2C: Tutorial: Adaptive System Design Tutorial (Remote) (Part 1)
15:00 – 15:30	**BREAK**		
15:30 – 17:00	2A: Tutorial: Systems Security Engineering for Trustworthy Systems (Remote) (Part 2)	2B: Tutorial: Predictive RGBD Simultaneous Localization and Mapping (SLAM) Systems for Robotics and Intelligent Vehicles (Part 2)	2C: Tutorial: Adaptive System Design Tutorial (Remote) (Part 2)

PROGRAM GRID - Tuesday, April 7, 2026				
7:00 – 17:30	**REGISTRATION (Coat Check)**			
8:00 – 9:00	**BREAKFAST – Halifax Ballroom**			
9:00 – 10:20	Opening & Keynote Robotics and Artificial Intelligence: Some Perspectives Keynote Speaker: Jason Gu Nova Scotia CD			
10:20 – 10:50	**BREAK - Foyer**			
Room	**Acadia A**	**Acadia B**	**Acadia C**	**Annapolis**
10:50 – 12:30	T1A: Robotics Navigation and Motion	T1B: Tactical Missions and Defense Readiness	T1C: SysML and Architecture Optimization	T1D: Agentic and Generative AI in Systems Engineering
12:30 – 13:30	**LUNCH - Halifax Ballroom**			
13:30 – 15:10	T2A: UAVs and Drone Operations	T2B: Intelligent Systems and Digital Requirements	T2C: Maritime and Autonomous Vehicles	T2D: Digital Twins and Modeling Frameworks
15:10 – 15:40	**BREAK - Foyer**			
15:40 – 17:20	T3A: Requirements Engineering and Formal Methods	T3B: Intelligent Optimization and Automation	T3C: Network Security and Attack Detection	T3D: Enterprise Systems and Organizational Dynamics
18:00 – 19:30	**Welcome Reception – Nova Scotia Foyer**			
19:30 – 21:00	**Young Professionals Event – Annapolis**			

PROGRAM GRID - Wednesday, April 8, 2026				
7:00 – 17:30	**REGISTRATION (Coat Check)**			
7:30 – 8:30	**BREAKFAST – Halifax Ballroom**			
8:30 – 10:30	Keynote & Panel Dependable and Secure Systems Keynote Speaker: Nur Zincir-Heywood Nova Scotia CD			
10:30 - 10:50	**BREAK - Foyer**			
10:50 – 12:30	SV1: Student Track Virtual Session Zoom			
Room	**Acadia A**	**Acadia B**	**Acadia C**	**Annapolis**
10:50 – 12:30	W1A: Privacy-Preserving Technologies	W1B: Military Logistics and Mission Engineering	W1C: Automotive and Aerospace Systems	W1D: The 8th Special Session: Aerospace Systems, Adaptive Systems and AI I
12:30 – 13:30	**LUNCH AND AWARDS - Halifax Ballroom**			
13:30 – 15:10	W2A: Smart Grids and Renewable Microgrids	W2B: Healthcare Systems Analysis	W2C: Resilient Infrastructure and Urban Planning	W2D: The 8th Special Session: Aerospace Systems, Adaptive Systems and AI II
15:10 - 15:40	**BREAK - Foyer**			
15:10 – 16:20	SP1: Student Track Poster Session Nova Scotia Foyer			
15:40 – 17:00	W3A: Systems Thinking for Resilient Systems	W3B: Special Session: AI-Enabled System-of-Systems Resilience for Critical Infrastructure	W3C: Special Session: Digitalization and Intelligence-Driven Systems Engineering Methods	
18:00 – 19:30	**Women in Systems Engineering (WiSE) Reception – Sable Ballroom** **Pre-registration is free but required.**			

PROGRAM GRID - Thursday, April 9, 2026				
7:00 – 12:30	**REGISTRATION (Coat Check)**			
7:30 – 8:30	**BREAKFAST – Halifax Ballroom**			
Room	**Acadia A**	**Acadia B**	**Acadia C**	**Annapolis**
8:30 – 10:10	R1A: Medical Diagnostics and Monitoring	R1B: Intelligent Transportation and Logistics	R1C: IoT, Communications, and Signal Processing	R1D: Sensors Integration and Applications III
10:10 – 10:40	**BREAK - Foyer**			
10:40 – 12:00	R2A: Performance, Optimization, and Education	R2B: Specialized Communication and Signal Processing	R2C: Special Session: Digitalization and Intelligence-Driven Systems Engineering Methods	

Tuesday, April 7

8:00 - 9:00
Tuesday Breakfast
Room: Halifax Ballroom

9:00 - 10:20
KN1: Opening & Keynote
Speaker: Jason Gu
Room: Nova Scotia CD

10:20 - 10:50
Tuesday AM Break

10:50 - 12:30
T1A: Robotics Navigation and Motion
Room: Acadia A
Chair: Sidney Givigi (Queen's University, Canada)

10:50 ***An Accelerated Reinforcement Learning Approach for Load-Carrying Mobile Robot Navigation***
João Victor de Mesquita Cândido dos Santos and Sergio Ronaldo Barros dos Santos (Federal University of Sao Paulo, Brazil); Sidney Givigi (Queen's University, Canada); André Marcorin de Oliveira (Federal University of Sao Paulo, Brazil)

11:10 ***Agile Command Streaming Software Interface for Smooth Robotics Motion in Dynamically Changing Environments***
Timon Hoebert (Practical Robotics Institute Austria, Austria & Bee Produced GmbH, Austria); Manuel Amersdorfer (Karlsruhe Institute of Technology, Germany); Munir Merdan (Practical Robotics Institute Austria, Austria); Thomas Meurer (Kiel University, Germany); Wilfried Lepuschitz (Practical Robotics Institute Austria, Austria); Eric Dokulil (Ing. Eric Dokulil, Austria); Markus Vincze (Vienna University of Technology, Austria)

11:30 ***M2X: An Interface for Communication between Mobile Robots and Peripherals***
Sven Franke (TU Dortmund University, Germany); Dennis Luensch (Fraunhofer Institute for Material Flow and Logistics, Germany); Constantin Enke (Karlsruhe Insitute of Technology, Germany); Susanne Junghans (IDEALworks GmbH, Germany); Jérôme Rutinowski and Alice Kirchheim (TU Dortmund University, Germany)

11:50 ***Autonomous Exploration Planning using Directed Single-Source Shortest Paths***
Fabrício Costa Souza Xavier and Sergio Ronaldo Barros dos Santos (Federal University of Sao Paulo, Brazil); Sidney Givigi (Queen's University, Canada)

12:10 ***Agree to Disagree: Consensus-Free Flocking under Constraints***
Peter Travis Jardine and Sidney Givigi (Queen's University, Canada)

10:50 - 12:30
T1B: Tactical Missions and Defense Readiness
Room: Acadia B
Chair: Amanda Weissman (Lockheed Martin, USA)

10:50 ***Applying Mission Engineering to Counter-Unmanned Aircraft Systems Missions***
Shannon Dubicki and Risa Gorospe (Johns Hopkins University Applied Physics Laboratory, USA)

11:10 ***Intelligence-Assisted Site Selection for Military Installation Planning***
Connie N. Summers (Engineer Research and Development Center, USA); Mary M Mitchell (USACE ERDC, USA); Hyeyon Bastian (United States Military Academy, USA); Patrick R Ables (Engineer Research and Development Center, USA); Randy Buchanan (ERDC, USA); Susan R Wolters (Engineer Research and Development Center, USA)

11:30 ***Enhancing Defense Readiness Through Lean Six Sigma: A Case Study in Serialized Materiel Management***
Logan D Dosan (United States Military Academy, USA); Patrick J Lupfer (United States Military Academy, USA & USMA, USA); Matthew Cavoli, Charles Farmer, Gavin Shields and Turner West (United States Military Academy, USA)

11:50 ***Applying Systems Thinking to the United States Army Corps of Engineers' Engineering Management System Implementation***
Patrick J Lupfer (United States Military Academy, USA & USMA, USA); Andrew S. Farrant (United States Military Academy (USMA), USA)

12:10 ***Evolving Approaches to Requirements Management in Defence Programs: Balancing As-Built Fidelity and Forward-Looking Intent in the Era of Digital Engineering***
Amanda Weissman (Lockheed Martin, USA)

10:50 - 12:30
T1C: SysML and Architecture Optimization
Room: Acadia C
Chair: Pierre de Saqui - Sannes (ISAE SUPAERO, France)

10:50 ***Formulating System Architecture Generation Problems using SysML v2***
Elias Allegaert (Siemens, Belgium); Olexiy Kupriyanov (Siemens AG, Germany); Jasper H. Bussemaker and Francesco Torrigiani (German Aerospace Center (DLR), Germany); Mike Nicolai (Siemens Digital Industries Software, Belgium)

11:10 ***System Architecture Optimization Using SysML v2: Language Extension and Implementation***
Jasper H. Bussemaker and Francesco Torrigiani (German Aerospace Center (DLR), Germany); Olexiy Kupriyanov (Siemens AG, Germany); Elias Allegaert (Siemens, Belgium); Luca Boggero and Björn Nagel (German Aerospace Center (DLR), Germany)

11:30 ***Compositional Reasoning over System Architectures with Integrated Cognitive Models***
Parth Ganeriwala, Candice Chambers and Siddhartha Bhattacharyya (Florida Institute of Technology, USA); Isaac Amundson and Junaid Babar (Collins Aerospace, USA)

11:50 ***Modelling the value of space project ecologies through systems architecting***
Alessandro Paravano and Paolo Trucco (Politecnico di Milano, Italy)

10:50 - 12:30
T1D: Agentic and Generative AI in Systems Engineering
Room: Annapolis
Chair: Tobias Schuermann (FZI Forschungszentrum Informatik, Germany)

10:50 ***Generative AI in Systems Engineering: A Framework for Risk Assessment of Large Language Models***
Stefan Otten, Philipp Reis, Philipp Rigoll, Tobias Schuermann, Joshua Ransiek, Jacob Langner and Eric Sax (FZI Research Center for Information Technology, Germany)

11:10 ***From Classroom to Enterprise: Architectural Patterns for LLM Integration***
Brian Moriarty (Stevens Institute of Technology, USA)

11:30 ***Structured Reasoning Frameworks for LLM-Based Venture Capital Evaluation: Integrating Systems Engineering and Business Analysis***
Dan Velarde (United States Military Academy, USA); Stephen Gillespie (United States Military Academy & United States Army, USA)

11:50 ***Automated BPMN Model Generation from Textual Process Descriptions: A Multi-Stage LLM-Driven Approach***
Ion Matei and Maksym Zhenirovskyy (Fujitsu Research of America, USA); Praveen Kumar Menaka Sekar (University of Maryland, College Park, USA); Hon Yung Wong (Fujitsu Research of America, USA)

12:30 - 13:30
Tuesday Lunch
Room: Halifax Ballroom

13:30 - 15:10
T2A: UAVs and Drone Operations
Room: Acadia A
Chair: Md Tahmid Rashid (Illinois State University, USA)

13:30 ***Automated Terminal Guidance for Low-Cost Drone-to-Drone Interception***
Sergii Baidachnyi (University of British Columbia, Canada); Rakiba Rayhana (The University of British Columbia, Canada); Hao Liu, Yu Hu, Christian Baker Davidson, Daniel Kovalevskiy, Xuanzhe Wang and Yihe Wang (University of British Columbia, Canada); Zheng Liu (University of British Columbia Okanagan, Canada)

13:50 ***VMBES: A Vision-Language-Guided Multi-UAV Framework for Bandwidth-Efficient Situational Awareness***
Md Tahmid Rashid (Illinois State University, USA); Md Jawad Siddique (Southern Illinois University, Carbondale, USA); Abdus Shaqur (Uttara University, Bangladesh)

14:10 ***Physics-Constrained Denoising Autoencoders for Data-Scarce Wildfire UAV Sensing***
Abdelrahman Ramadan, Zahra Dorbeigi Namaghi, Emily Taylor, Lucas Edwards and Xan Giuliani (Queen's University, Canada); David McLagan (Queens University, Canada); Sidney Givigi and Melissa Greeff (Queen's University, Canada)

14:30 ***A Cyber-Resilient Control Framework for UAV Systems Using Zero-Sum Game Theory and Iterative Learning***
Najwa Alkaoui (Université de Moncton, Canada); Mohammad Abouheaf (Bowling Green State University, USA); Nabil Nahas (Université de Moncton, Canada)

13:30 - 15:10
T2B: Intelligent Systems and Digital Requirements
Room: Acadia B
Chair: Tim Eveleigh (Orano USA, USA)

13:30 ***An Agentic, Multimodal RAG Framework for Risk-Aware Surgical Robotics User Manual Creation***
Paige Kendell (Smith & Nephew, USA); Alexander Semenov (CapGemini, France); Wei Zhang (Smith and Nephew, USA)

13:50 ***Application of Model-Based Structured Requirements to Facility Systems Engineering***
Michael Ali and Tim Eveleigh (Orano USA, USA)

14:10 ***From Blueprint to Reality: A Practitioner's Method for SysML Hardware and Software Deployment Tracking***
Adam Weissman (Lockheed Martin Canada)

14:30 ***Key Learnings from Deploying Scale-Up Fabric on AI Rack Solutions***
Anna Mary Mathew (Microsoft, USA); Sharjil Khan (Microsoft Corporation, USA); Krishna Kakarla (Microsoft Research, USA)

13:30 - 15:10
T2C: Maritime and Autonomous Vehicles
Room: Acadia C
Chair: TBA

13:30 ***Navy Mission Engineering to Digitally Transform Ship Design***
Geoffrey Kerr (Virginia Polytechnic Institute and State University, USA); Alan Brown (Virginia Tech, USA); James Moreland (Virginia Tech National Security Institute, USA); Rick Silverman (Naval Surface Warfare Center Philadelphia Division, USA)

13:50 ***A Unified Model-Based Framework For Whole Warship Engineering***
Pierluigi Gravili, Andrea Gualco, Gianluigi Mattia, Manuela Nardini and Elisa Nitoglia (Orizzonte Sistemi Navali Spa, Italy); Francesco Inglima, Francesco Nudo, Giuliano Pompeo, Antonella Persechino and Pasquale Polisi (Capgemini Engineering, Italy)

14:10 ***Operational Hypervisor: Anomaly Detection and Handling for Automated Electric Vehicles***
Veljko Vučinić (Karlsruher Institut für Technologie, Germany); David Kraus (Karlsruhe Institute of Technology, Germany); Dragan Aleksendrić (University of Belgrade, Serbia); Eric Sax (Karlsruhe Institute of Technology, Germany)

14:30 ***Control of Fixed-Wing Flocking Coordination under Wind Speed Disturbance***
Fabrício Costa Souza Xavier and Sergio Ronaldo Barros dos Santos (Federal University of Sao Paulo, Brazil); Sidney Givigi (Queen's University, Canada)

14:50 ***Leveraging SATCOM Ka-Band Signals for PNTaaS***
Maor Dov (Naval Postgraduate School, USA); Alison Brown (NAVSYS Corporatiaon, USA); Oleg Yakimenko, Giovanni Minelli and Noah Weitz (Naval Postgraduate School, USA)

13:30 - 15:10
T2D: Digital Twins and Modeling Frameworks
Room: Annapolis
Chair: Loic Lagadec (ENSTA & LabSticc - CNRS 6285, France)

13:30 ***Model-Based Systems Engineering: Digital Shadow for the Advanced Quantitative Precipitation Information System Monitoring Framework***
Ragesh Gopalakrishnan Jayalalithaa and V. Chandrasekar (Colorado State University, USA); William M Brooks (The Boeing Company, USA & Colorado State University, USA)

13:50 ***Enabling Digital Twins for Heterogeneous Battery Systems - An Experience Report***
Emil Lundin (Sigma Technology Embedded Solutions, Sweden); Johan Cederbladh (Mälardalen University, Sweden); Martin Viker (Sigma Technology Embedded Solutions, Sweden)

14:10 ***Bond-Graph Simulation for Synthetic Data Generation in a Marine Winch Digital Twin***
Jarrett Brewer, Andy Simoneau and Rickey Dubay (University of New Brunswick, Canada)

14:30 ***Integrating Neuromorphic Sensors, Digital Twins, and MBSE Interfaces for System Validation***
Emi Aoki, Flore Stécie Norcéide and Gayathri Boopathy (University of Massachusetts Lowell, USA); Charles Thompson (Umass Lowell, USA); Kavitha Chandra (University of Massachusetts Lowell, USA)

14:50 ***PrOMETHeUS: A Tool For DEVS Modelling and Visualization***
Curtis Winstanley (Defence Research and Development Canada, Canada); Iryna Borshchova (National Research Council Canada, Canada); Gabriel Wainer (Carleton University, Canada)

15:10 - 15:40
Tuesday PM Break

15:40 - 17:20
T3A: Requirements Engineering and Formal Methods
Room: Acadia A
Chair: Abdelrahman Ramadan (Queen's University, Canada)

15:40 ***Automated Derivation of Formal Properties from Requirements***
Bastien Sultan (Telecom Paris, France); Ludovic Apvrille (Telecom Pairs, France); Pierre de Saqui-Sannes (ISAE-SUPAERO, Université de Toulouse, France)

16:00 ***Contracts over Clusters: From Mission Guarantees to System Verification***
Loic Lagadec (ENSTA & LabSticc - CNRS 6285, France); Ciprian Teodorov and Loïc Plassart (ENSTA, France); Jannik Laval (Université Lumière Lyon 2, Lyon, France); Charbel Aoun (ICAM, France)

16:20 ***Security analysis of Precision Time Protocol v2.1 using TLA+***
Antoine Lemay and Hugo Genesse (Hitachi Energy Research, Canada)

16:40 ***Modeling and Executing Defensive Deceptive Network Policies using the DEVS Formalism***
David Haighton and Sylvain P. Leblanc (Royal Military College of Canada, Canada)

17:00 ***DT-Blocks: A Web-Based Framework for Dependability Assessment using Reliability Block Diagrams***
Carlos Melo (Universidade de Pernambuco, Brazil & Universidade Federal de Sergipe, Brazil); Raquel Trajano (UFPE, Brazil); Jamilson Dantas (University Federal of Pernambuco & UFPE, Brazil); Luiz Bittencourt (Unicamp, Brazil); Jean Araujo (Universidade Federal Do Agreste de Pernambuco, Brazil)

15:40 - 17:20
T3B: Intelligent Optimization and Automation
Room: Acadia B
Chair: Ion Matei (Fujitsu Research of America, USA)

15:40 ***Autonomous Business System via Neuro-symbolic AI***
Cecil Pang (Binghamton University, USA & USA TODAY Co. Inc., USA); Hiroki Sayama (Binghamton University, USA)

16:00 ***A Revised End-to-End learning Task Assignment Framework***
Yazan Youssef (Queen's University, Canada); Aboelmagd Noureldin (Royal Military College of Canada & School of Computing, Queen's University, Canada); Sidney Givigi (Queen's University, Canada)

16:20 ***Towards Adaptive and Energy-Aware Task Offloading in Edge-Cloud Environments***
Muhammad Minhajuddin, Faria Khandaker and A B M Bodrul Alam (Algoma University, Canada)

16:40 ***Validation of Supply Chains AI/ML Model with Synthetic Data for Embedded Semiconductors***
Matthew C Gunn, Davis C Loose, Megan E. Gunn, Megan C. Marcellin, Negin Moghadasi and Thomas Polmateer (University of Virginia, USA); Zachary A Collier (Radford University, USA); Igor Linkov (USA); James H. Lambert (UVa, USA)

17:00 ***Systems Optimization and Risk Management of Sensor Networks for Detection of Wildfires***
Megan E. Gunn (University of Virginia, USA); R. Ranger Dorn (Electric Infrastructure Security Council, USA); Matthew C Gunn and Davis C Loose (University of Virginia, USA); Bilal Ayyub (USA); William A. Barletta (Massachusetts Institute of Technology, USA); John F. Organek (Electric Infrastructure Security Council, USA); Marco Piras (Politecnico di Torino, Italy); S. Fabrizio Zichichi (Ettore Majorana Foundation and Centre for Scientific Culture, Italy); James H. Lambert (UVa, USA)

15:40 - 17:20
T3C: Network Security and Attack Detection
Room: Acadia C
Chair: TBA

15:40 ***Malicious Command Line Detection***
Emilie Coote and Taylor Perkins (Deloitte Canada, Canada); Brian Lachine (Royal Military College of Canada, Canada); Chandra Majumdar (Deloitte Canada, Canada)

16:00 ***Graph Neural Network-based Detection of Man-in-the-Middle Attacks***
Awatef Khoury (Technion - Israel Institute of Technology, Israel); Avi Mendelson (Computer Science Technion & Technion, Israel); Ori Shacham-Barr (Technion, Israel)

16:20 ***Quantifying Mission Risk Through a Cyber Data-Driven Analysis Approach***
Valentina Waters (MITRE Corporation, USA); Jeremy Marshall (MITRE Corp, USA); Quinn Spitzer, Richard Lynn Swihart and Aleksandra Markina-Khusid (MITRE Corporation, USA)

16:40 ***Evaluating Few-Shot Large Language Models for Intrusion Detection in Smart Grid Communication Systems***
Nourhan Ibrahim and Rasha Kashef (Toronto Metropolitan University, Canada)

15:40 - 17:20
T3D: Enterprise Systems and Organizational Dynamics
Room: Annapolis
Chair: Nejib Moalla (University Lumiere Lyon 2, France)

15:40 ***Socio-Economic-Technical Synthesis: A Novel Triple Bridge Framework for Quantifying the Impact of Organizational Knowledge Gaps on Technical System Failures***
Raymond K Jonkers (Merlantec Management and Engineering, Canada)

16:00 ***Uncertainty and the Enterprise Lifecycle Part 2: Organizational Capabilities***
Sian Terry and V. Chandrasekar (Colorado State University, USA)

16:20 ***Modeling Product-Process-Resource Variability in Early Design Phases of Production Systems***
Lasse Beers (Helmut-Schmidt-University, Germany); Hamied Nabizada (Helmut Schmidt University, Germany); Alain Chahine (Airbus Operations GmbH, Germany); Felix Gehlhoff (Helmut Schmidt University, Germany); Alexander Fay (Ruhr University Bochum, Germany)

16:40 ***Digital Product Passport for the Electronics Industry***
Timon Hoebert (bee produced GmbH, Austria); Andreas Krimbacher (Nexyo GmbH, Austria); Tassilo Pellegrini (St. Pölten University of Applied Sciences, Austria); Christin Otto (Würth Elektronik eiSos GmbH & Co. KG, Germany); Thomas J. Lampoltshammer (University for Continuing Education Krems, Austria); Klaus-Dieter Rauch (Rauch Elektronik GmbH, Austria); Mario Fasching (ESECO GmbH, Austria); Anna Cossa (Nexyo GmbH, Austria); Munir Merdan (bee produced GmbH, Austria)

17:00 ***Change-Aware Test Suite Prioritization for CPS using Multi-Domain Dependency Graphs***
Maximilian Beck (Karlsruhe Institute of Technology, Germany); Jonas Boll (Karlsruhe Institute of Technology); Vitus A Lüntzel and Eric Sax (Karlsruhe Institute of Technology, Germany)

18:00 - 19:30
Welcome Reception
Room: Nova Scotia Foyer

19:30 - 21:00
Young Professionals Event
Room: Annapolis

Wednesday, April 8

7:30 - 8:30
Wednesday Breakfast
Room: Halifax Ballroom

8:30 - 10:30
K2: Keynote & Panel
Speaker: Nur Zincir-Heywood
Room: Nova Scotia CD

10:30 - 10:50
Wednesday AM Break

10:50 - 12:30
SV1: Student Track Virtual Session
Room: Virtual (CONFlux Only)
Chairs: Prasanta Ghosh (Syracuse University, USA), Bozenna Pasik-Duncan (The University of Kansas, USA), Stephanie M. White (Long Island University, USA)

10:50 ***Eco-friendly IoT: Leveraging Energy Harvesting for a Sustainable Future***
B. N. Karthik, Kalivi Kiran and G. Abishek (Sathyabama Institute of Science and Technology, India)

11:00 ***Waste_AI Predict: A Smart, ML-Driven System for Dynamic Waste Collection Optimization***
Natanel Pakman and Fabian Roitman (HIT, Israel); Michael Winokur (Holon Institute of Technology, Israel)

11:10 ***Who Judges the Model? An Agentic Approach to Conceptual Model Evaluation***
Veronika Shteingardt (Technion - Israel Institute of Technology, Israel); Dov Dori (Technion, Israel Institute of Technology, Israel)

11:20 ***Embedded Edge AI: Optimizing Neural Network MPPT for High-Efficiency Solar IoT Nodes***
Salvador Yabar (Pontificia Universidad Católica del Perú, Peru)

11:30 ***Emergence and Tacit Knowledge Retention in System Development***
Richard Anthony Sena (George Washington University, USA); Timothy J Eveleigh (The George Washington University & Orano USA, USA)

11:40 Break

11:50 ***Pulsar Detection Comparison Between Different AI/ML Architectures***
Advik Singh (Rouse High School, USA)

12:00 ***Multivariate Load Forecasting Using CEEMDAN Decomposition and PSO-Optimized Gated Recurrent Units: A Case Study in Malaysia***
Ginika Okoroafor and Raphael O. Idem (University of Regina, Canada); Charles Sarimuthu (Monash University Malaysia, Malaysia); Patrick W. C. Ho (Monash University, Australia)

12:10 ***From Segmentation to Intervention: Causal Root-Cause Diagnosis in Nonstationary Multivariate Time Series***
Cansu Yalim (Old Dominion University, USA)

12:20 ***Discrete Event Simulation of Global Cargo Delivery via Rocket Propulsion***
Johann Vennink and Luis Daniel Otero (Florida Institute of Technology, USA)

10:50 - 12:30
W1A: Privacy-Preserving Technologies
Room: Acadia A
Chair: Abdelrahman Ramadan (Queen's University, Canada)

10:50 ***Private Fitness Tracking from Wearable Sensors with Zero-Knowledge Machine Learning***
Augusto Magalhães Pinto de Mendonça (Universidade Federal Fluminense, Brazil); Filipe Pessoa Sousa (Universidade do Estado do Rio de Janeiro, Brazil); Fellipe Souza Pessanha (Universidade Federal Fluminense, Brazil); Igor Machado Coelho (Fluminense Federal University, Brazil)

11:10 ***Privacy-Preserving Ensemble Learning for Medical Image Diagnostics using Post-Quantum Cryptography***
Joseph O'Neill (Dalhousie University, Canada); Lydia Bouzar-Benlabiod (Acadia University, Canada); Nur Zincir-Heywood (Dalhousie University, Canada)

11:30 ***A Stochastic Petri Net Approach for Evaluating Resource Utilization and Costs in Cloud-Hosted ZK-Rollups***
Carlos Melo (Universidade de Pernambuco, Brazil & Universidade Federal de Sergipe, Brazil); Johnnatan Messias (MPI-SWS, Germany); Glauber Gonçalves and Francisco Airton Silva (Universidade Federal do Piauí, Brazil); André Soares (Federal University of Piaui, Brazil); José Miqueias (UFPI, Brazil); Jean Araujo (Universidade Federal Do Agreste de Pernambuco, Brazil)

11:50 ***Modeling the Impact of Network Link Dropout on Robust Federated Learning in Distributed Compute Environments***
Neena Imam (Southern Methodist University, USA); Tomasz Bednarz (NVIDIA Corporation, USA)

12:10 ***Multi-System Predictive Modeling: Lossless and Communication-Efficient Ridge Logistic Regression with Vertically Partitioned Data***
Marie-Pier Domingue, Jean-François Ethier and Simon Lévesque (Université de Sherbrooke, Canada); Anita Burgun (Necker Hospital, AP-HP, France); Félix Camirand Lemyre (Université de Sherbrooke, Canada)

10:50 - 12:30
W1B: Military Logistics and Mission Engineering
Room: Acadia B
Chair: Haibin Zhu (Nipissing University, Canada)

10:50 ***Joint Scheduling of Use-Based and Calendar Inspections in Military Aircraft Fleet Planning***
Matteo Vescovi and Gianluca Massara (Polytechnic Institute of Milan, Italy); Valentina Breschi (Eindhoven University of Technology, The Netherlands); Roberto Valdambrini (Italian Air Force, Italy); Andrea Mercurio (Ministero Difesa, Italy); Mara Tanelli (Polytechnic Institute of Milan, Italy)

11:10 ***A Unified Platform for Staff Assignment Using E-CARGO and Group Role Assignment***
Evan D Wells and Haibin Zhu (Nipissing University, Canada)

11:30 ***Enhancing the Sustainment Warfighter Function in Constructive Training***
Madison Oliver and Abigail J. Crocker (United States Military Academy, USA)

11:50 ***Probabilistic Agents in Deterministic Audits: Evaluating Multi-Agent Systems for Automated Audits Based on the German IT-Grundschutz***
Lea Roxanne Muth and Marian Margraf (Freie Universität Berlin, Germany)

12:10 ***Drone-Augmented Ground Sensors: A Model-Based Systems Engineering Approach to Area Denial***
Benedetto Fusco, Ashley Hubert, Dan Velarde, Kathryn Wegler, Justus Whitaker and Vikram Mittal (United States Military Academy, USA)

10:50 - 12:30
W1C: Automotive and Aerospace Systems
Room: Acadia C
Chair: Rigdha Acharya (Microsoft, USA & AHSI, USA)

10:50 ***Threat Modeling of Infineon AURIX for Automotive ECUs: A Systems Engineering Approach***
Narges Rahimi (University of Windsor, Canada & SHIELD Automotive Cybersecurity Centre of Excellence, Canada); Mitra Mirhassani (University of Windsor, Canada)

11:10 ***Novel Test Framework for Hyperscale Qualification of AI Platforms at Microsoft Azure***
Anna Mary Mathew and Michael Chhor (Microsoft Corporation, USA); Rigdha Acharya (Microsoft, USA & AHSI, USA)

11:30 ***Predictive Modeling of Wildfire Risk in California, North America, using Machine Learning Ensembles***
Craig Beaubien, Colton Carvalho, Walid Hakimzada, Thanh Le and Bonaventure Chidube Molokwu (California State University, Sacramento, USA)

11:50 ***Dynamic Programming-Based Analysis of Cabin Preconditioning in Electric Coaches***
Nikola Lukezic (Karlsruher Institut für Technologie, Germany); Laurenz Adolph (FZI Research Center for Information Technology, Germany); Korbinian Rudolf (Karlsruher Institute for Technology, Germany); Carolin Schiefer and Eric Sax (Karlsruhe Institute of Technology, Germany)

12:10 ***Contrails over Sweden: Patterns in the Sky***
Tobias Elneros, Tatiana Polishchuk, Lucie Smetanová and Lucie Havelka Smetanová (Linköping University, Sweden)

10:50 - 12:30
W1D: The 8th Special Session: Aerospace Systems, Adaptive Systems and AI I
Room: Annapolis
Chairs: Paul C. Hershey (RTX, USA), Haifeng Zhu (BAE Systems, USA)

10:50 ***A Theory for Systems Engineering***
Haifeng Zhu (BAE Systems, USA)

11:10 ***Adaptable City Planning***
Haifeng Zhu (BAE Systems, USA); Sirasak Tepjit (King Mongkut's University of Technology North Bangkok, Thailand); Ray L Barton (Advanced Technology & Engineers for the Profession, INCOSE Canada, Vitesse Reskilling Canada, Enercom Canada, Canada)

11:30 ***Scenario-Based Stochastic Mixed-Integer Linear Programming for Manufacturing Footprint and Patient Access***
Jack Lewis, Seth Chung, Daniel Hong, Benjamin Johnson and Xavier Ramos (United States Military Academy, USA); Ahmed Bahabry (USMA at West Point, USA)

11:50 ***Natural Language Processing for Aerospace Regulatory Requirements***
Alexander Simpson and David C Gross (Florida State University, USA)

12:10 ***High Granularity, Moving Target Address Space Layout Randomization Through Dynamic Fragmentation***
Patrick W Hong (Raytheon, USA)

12:30 - 13:30
Wednesday Lunch & Awards
Room: Halifax Ballroom

13:30 - 15:10
W2A: Smart Grids and Renewable Microgrids
Room: Acadia A
Chair: Hamed Aly (Dalhousie University, Canada)

13:30 ***Equity-Aware Multi-Objective Optimization for Renewable Microgrids***
Augusto Magalhães Pinto de Mendonça (Universidade Federal Fluminense, Brazil); Filipe Pessoa Sousa (Universidade do Estado do Rio de Janeiro, Brazil); Igor Machado Coelho (Fluminense Federal University, Brazil); Laura de Assis (CEFET/RJ, Brazil)

13:50 ***A Multi-Criteria Decision Model for Renewable Microgrid Operation Using AHP and Metaheuristic Weight Optimization***
Filipe Pessoa Sousa (Universidade do Estado do Rio de Janeiro, Brazil); Augusto Magalhães Pinto de Mendonça (Universidade Federal Fluminense, Brazil); Igor Machado Coelho (Fluminense Federal University, Brazil); Cristiane Oliveira De Faria (Universidade do Estado do Rio de Janeiro, Brazil)

14:10 ***Hybrid AI-FACTS Optimization for Nova Scotia Grid: A Physics-Informed Deep Learning Approach for Real-Time Voltage Stability Enhancement***
Mahmoud Kiasari and Hamed Aly (Dalhousie University, Canada)

14:30 ***Explainable Deep Learning for Real-Time Power Quality Event Detection and Diagnosis in Smart Grids: A SHAP-Enhanced CNN-LSTM Framework with PYPOWER Simulation Validation***
Mahmoud Kiasari and Hamed Aly (Dalhousie University, Canada)

14:50 ***Integrated AVR-LFC Optimization for Multi-Area Power Systems Using Simulated Annealing***
Najwa Alkaoui and Nabil Nahas (Université de Moncton, Canada); Mohammad Abouheaf (Bowling Green State University, USA)

13:30 - 15:10
W2B: Healthcare Systems Analysis
Room: Acadia B
Chair: Yazan Youssef (Queen's University, Canada)

13:30 ***Mobile Healthcare analysis: An approach to estimate performability and availability requirements***
Bruno Felipe de França Souza (Universidade Federal de Pernambuco, Brazil); Gustavo Callou (Federal Rural University of Pernambuco, Brazil & UFRPE, Brazil); Jamilson Dantas (University Federal of Pernambuco & UFPE, Brazil)

13:50 ***Modeling and Simulation Based Development of a Teleoperated Slit Lamp***
Sasisekhar Govind and Gabriel Wainer (Carleton University, Canada); Lindsey Marvel and Kastrirangan Iyengar (EyemoteVision Inc., USA)

14:10 ***A Data Framework for Behavioral Health with Digitized Drawings and Photographs***
Mohamed Abdullah F (Aalim Muhammed Salegh College of Engineering, India); Jihye Kwon (University of Alaska Anchorage, USA); Bagwan N (RGIPT, India); Ishaan Gupta (Netaji Subhas University of Technology, India); David Moxley and Pradeeban Kathiravelu (University of Alaska Anchorage, USA)

14:30 ***Consistency Preservation in Integrated Product Engineering - an Industrial Study***
Maximilian Fischer (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering at KIT, Germany); Timo Müller (Karlsruhe Institute of Technology (KIT) - Germany, Germany); Philipp Kreit (Karlsruhe Institute of Technology (KIT), Germany); Lars Gesmann (Karlsruhe Institute of Technology KIT, Germany); Tobias Düser (Karlsruhe Institute of Technology (KIT) & IPEK - Institute of Product Engineering at KIT, Germany); Albert Albers (Karlsruhe Institute of Technology (KIT), Germany)

13:30 - 15:10
W2C: Resilient Infrastructure and Urban Planning
Room: Acadia C
Chair: Sanjeevikumar P (University of South-Eastern Norway, Norway)

13:30 ***A Systems Modeling Framework for Resilient Infrastructure Planning with Dynamic Context States***
Cody Pennetti and Megan C. Marcellin (University of Virginia, USA); Jungwook Jun (Virginia Department of Transportation, USA); James H. Lambert (UVa, USA)

13:50 ***Stochastic Modeling of the Physical-Digital Continuum: Assessing Feasibility in Decentralized Environmental Monitoring***
Carlos Melo (Universidade de Pernambuco, Brazil & Universidade Federal de Sergipe, Brazil); Jean Araujo (Universidade Federal Do Agreste de Pernambuco, Brazil)

14:10 ***Experimental Analysis of a Non-linear Rotating Flexible Manipulator Integrated with a Piezoelectric Energy Harvester***
Renwyn Medina (The University of the West Indies, Trinidad and Tobago); Jacqueline Bridge (Trinidad and Tobago); Rickey Dubay (University of New Brunswick, Canada)

13:30 - 15:10
W2D: The 8th Special Session: Aerospace Systems, Adaptive Systems and AI II
Room: Annapolis
Chairs: Paul C. Hershey (RTX, USA), Haifeng Zhu (BAE Systems, USA)

13:30 ***A Post-Disaster UAV-Based Communication Scheme: Victim Status Monitoring via Ambient Backscattering***
Ali Gaber Mohamed Ali (Alexandria University Alexandria Egypt, Egypt); Mohamed El-Rakaiby (Alexandria University, Egypt & Vodafone, Egypt); Mohammed Karmoose (Nile University, Egypt & Alexandria University, Egypt); Mohamed Abdelkarim AboulHassan Mohamed (Alamein International University, Egypt)

13:50 ***A Systems Engineering Model for Integrating RAG-Based AI into Army Sick Call Workflows***
Kira Macmullan and Alex Zhang (United States Military Academy, USA); Cody Bradford (USMA - West Point, USA); Elhadji Kone and Peter Segat (United States Military Academy, USA); Ahmed Bahabry (USMA at West Point, USA)

14:10 ***System for Adaptable, Scalable, and Autonomous Protection Verification and Decision Support (ASAP VDS) During Mission Planning and Execution***
Paul C. Hershey (RTX, USA)

14:30 ***Adaptations for Mission Management and Engineering***
Haifeng Zhu (BAE Systems, USA); Christopher L. Lafikes (The Boeing Company, USA); William M Brooks (The Boeing Company, USA & Colorado State University, USA)

14:50 ***An Evaluation Space with Unknown Missions and Requirements***
Haifeng Zhu (BAE Systems, USA)

15:10 - 15:40
Wednesday PM Break

15:10 - 16:20
SP1: Student Track Poster Session
Room: Nova Scotia Foyer
Chairs: Prasanta Ghosh (Syracuse University, USA), Bozenna Pasik-Duncan (The University of Kansas, USA), Stephanie M. White (Long Island University, USA)

Enhancing Resilience in Cold Chain Vaccine Logistics through a Systems Engineering Framework
Krishna Shah (George Washington University, USA); Timothy J Eveleigh (The George Washington University & Orano USA, USA)

Bus Systems - Implementations to Improve Ridership
Sam Miao and Reginald U Bailey (George Washington University, USA)

Listening to the System: Consumer Complaints as Early Warning Signals
Jennifer Zhang and Reginald U Bailey (George Washington University, USA)

Smart Edge Proximity Alarm System for Construction Safety (Virtual)
Abdulmalik Alshayeb (King Saud University, Saudi Arabia)

File-Size-Aware Heterogeneous Coded TeraSort
Haoyun Deng and Yong Deng (Lakehead University, Canada)

Addressing Class Imbalance in CNN-LSTM Intrusion Detection Systems
Mohammod Haque and Lydia Bouzar-Benlabiod (Acadia University, Canada)

Explainable Machine Learning Framework for Site Suitability Assessment of Multi-Generation Renewable Energy Systems in Developing Regions (Virtual)
Fadel Abdelrahman, Hussain Mohammad Al-Qahtani and Bekir Sami Yilbas (King Fahd University of Petroleum and Minerals, Saudi Arabia)

Explaining 3D CNN Decisions for Alzheimer's MRI Classification: A SHAP-Based Analysis of Preprocessing Bias
Hassen Gadacha (ENSI, Tunisia); Lydia Bouzar-Benlabiod and Andrew McIntyre (Acadia University, Canada)

A Distributed System to Analyze the Impacts of Aircraft Predictive Maintenance
Samridhi Girdhar and Peash Ranjan Saha (University of New Brunswick Saint John, Canada)

Keras-based Grammatical Evolution for Convolutional Neural Network Architecture Search
Jay Patel and Andrew McIntyre (Acadia University, Canada)

Memory-Efficient Quantization-Aware Optimization for FHE-Based Mammogram Classification
Mohamed Khattab and Lydia Bouzar-Benlabiod (Acadia University, Canada)

Standardized Take-Off and Landing Procedures for Urban Air Mobility Operations Across Diverse Operational Environments (Virtual)
Faizana Naeem (Hamburg University of Technology, Germany); Volker P.W. Gollnick (Hamburg University of Technology, TUHH, Germany)

Embedding Model Benchmarks for Text Classification
Kristian Nordby, Zachary Reynolds, Eric Dailey and David Beskow (United States Military Academy, USA)

Exploratory Analysis of Dementia Risk Factors Using Distributed Data Systems
Taryn Cail and Peash Ranjan Saha (University of New Brunswick Saint John, Canada)

Enhance Electric Vehicles Charging Efficiency Using Trip Information (Virtual)
Umar Jamil and Yufang Jin (University of Texas at San Antonio, USA)

Model-Based Systems Engineering Framework for Trustworthy Agent-Native Financial Gateways
Han Li and Benjamin Stirgwolt (George Washington University, USA)

15:40 - 17:00
W3A: Systems Thinking for Resilient Systems
Room: Acadia A
Chair: Heigo Mõlder (Tallinn University of Technology, Estonia)

15:40 ***Articulating Quality of Service Issues in Wireless Communications to Implement Effective Corrective Strategies Using System Dynamics***
Boris Ramos (Escuela Superior Politécnica del Litoral (ESPOL), Ecuador)

16:00 ***Design and Optimization of a Distributed Low- Visibility Mesh Network in Contested Environments***
Logan D Dosan, Ryan Monagle, Benjamin S Lynch and Karthik Kottapalli (United States Military Academy, USA); Ethan Slick (Youngstown University, USA); Vikram Mittal (United States Military Academy, USA)

16:20 ***Integrated Path Planning of MASS Navigation in Non-Standard Maritime Encounters***
Heigo Mõlder, Karl Janson, Jüri Vain and Kristjan Tabri (Tallinn University of Technology, Estonia); Pentti Kujala (Estonian Maritime Academy, Tallinn University of Technology, Estonia); Aqsa Yaseen (Tallinn University of Technology, Estonia)

16:40 ***Barriers to Sustainable Homebuilding on Prince Edward Island: A Systems-Thinking Perspective***
Melanie LeBlanc MacIsaac and Stephanie Shaw (University of Prince Edward Island, Canada)

15:40 - 17:00
W3B: Special Session: AI-Enabled System-of-Systems Resilience for Critical Infrastructure
Room: Acadia B
Chair: Yang Li (Northeast Electric Power University, China)

15:40 ***Design and Integration of an Intelligent Battery Management System for Low-Voltage Redox Flow Battery with Solar Interface***
Hemavathi S (ECPS Battery Division, CSIR - Senior Scientist, India); Sanjeevikumar P (University of South-Eastern Norway, Norway)

16:00 ***Toward a Model-Based Resilience Engineering Framework for Maritime Power Systems***
Christina Kalantzi and David C Gross (Florida State University, USA)

16:20 ***AI-Enabled System-of-Systems Resilience for Critical Infrastructure: A Systems Engineering Framework and Mechanism-Oriented Analysis***
Yang Li (Northeast Electric Power University, China)

16:40 ***Ethical Risk Assessment for AI-Driven Fraud Detection in Healthcare Claims***
Gayathri Surianarayanan (Isoftech Inc, USA); Srikanth Singireddy (Tangoe Inc, USA); Abinaya Mettupatti Sivagnanam (GDIT, USA)

15:40 - 17:00
W3C: Special Session: Digitalization and Intelligence-Driven Systems Engineering Methods
Room: Acadia C
Chairs: Nejib Moalla (University Lumiere Lyon 2, France), Tianxiao Xu (Université Lumière Lyon 2, France & IVECO France, France)

15:40 ***A Semantically Integrated Approach for MBSE-MDAO Model Transformation***
Tianxiao Xu (Université Lumière Lyon 2, France & IVECO France, France); Nejib Moalla (University Lumiere Lyon 2, France); Mohand-Lounes Bentaha (Université Lumière Lyon 2, France); Giuseppe Cereda and Claudia Agostinelli (IVECO SPA, Italy)

16:00 ***Toward an NLP Toolkit for Extracting Requirements from Standards***
Naqash Ali (Florida State University, USA); Ryan Carmichael (Center for Advanced Power Systems, Florida State University, USA); David C Gross, Matthew Bosworth, Carmen Araujo and Karl Schoder (Florida State University, USA)

16:20 ***Adaptable Requirement Engineering***
Haifeng Zhu (BAE Systems, USA); Ronald Carson (INCOSE, USA); Ray L Barton (Advanced Technology & Engineers for the Profession, INCOSE Canada, Vitesse Reskilling Canada, Enercom Canada, Canada)

18:00 - 19:30
WiSE Reception
Room: Sable Ballroom

7:30 - 8:30
Thursday Breakfast
Room: Halifax Ballroom

8:30 - 10:10
R1A: Medical Diagnostics and Monitoring
Room: Acadia A
Chair: Bayazit Karaman (Florida Polytechnic University, USA)

8:30 ***A Systems Engineering Approach to a Wearable Assistive Monitoring Device for Dementia Patients***
Idunnuoluwa Joshua Adewolu (New York University, USA)

8:50 ***Grounded Patient-Level Narrative Generation for Alzheimer's Disease Using Multimodal Biomarkers***
Sumaya Hossain, Bismack Tokoli, Tyler Mondalto, Parisa Hajibabaee and Bayazit Karaman (Florida Polytechnic University, USA)

8:30 - 10:10
R1B: Intelligent Transportation and Logistics
Room: Acadia B
Chair: Anthony O Adeyemi-Ejeye (University of Surrey, United Kingdom (Great Britain))

8:30 ***Mitigating Maintenance Bottlenecks in Intelligent Transportation Systems: A Petri Net Approach***
Raquel Trajano (UFPE, Brazil); Carlos Melo (Universidade de Pernambuco, Brazil & Universidade Federal de Sergipe, Brazil); Jean Araujo (Universidade Federal Do Agreste de Pernambuco, Brazil); Jamilson Dantas (University Federal of Pernambuco & UFPE, Brazil)

8:50 ***Predicting Error Types and Timing in Quay Crane Operations with eXtreme Gradient Boosting***
Robert Klar (Linköping University & Swedish National Road and Transport Research Institute (VTI), Sweden); Vangelis Angelakis (Linköping University, Sweden)

9:10 ***8KUHD Forward Facing Video for Rail Safety: An Exploratory Study of Practitioner Perception***
Anthony O Adeyemi-Ejeye (University of Surrey, United Kingdom (Great Britain)); Gregory Howell (Rail Innovations, United Kingdom (Great Britain)); Mikolaj I. Leszczuk (AGH University of Science and Technology & University of Computer Engineering and Telecommunications, Poland)

9:30 ***Enterprise Resilience and Trust in Multiscale Logistics Systems***
Davis C Loose, Megan E. Gunn, Megan C. Marcellin and Matthew C Gunn (University of Virginia, USA); Femi Popoola (Virginia Economic Development Partnership, USA); Karen R Jackson (Commonwealth Center for Advanced Logistics Systems, USA); Eric Jehu (Virginia Economic Development Partnership, USA); Igor Linkov (USA); James H. Lambert (UVa, USA)

8:30 - 10:10
R1C: IoT, Communications, and Signal Processing
Room: Acadia C
Chair: Faria Khandaker (Algoma University, Canada)

8:30 ***Modeling Energy-Performance-Aware IoT Networks Using Hierarchical Colored Petri Nets***
Diogo Lima Lages (University Federal of Pernambuco, Brazil); Marcos Falcão and Andson M Balieiro (Federal University of Pernambuco, Brazil); Jamilson Dantas (University Federal of Pernambuco & UFPE, Brazil); Dalton C. G. Valadares (Universidade Federal de Campina Grande (UFCG) & Instituto Federal de Pernambuco (IFPE), Brazil)

8:50 ***RyuQoSFlow: An Integrated Architecture for Real-Time QoS in SDN via Prioritization and Monitoring***
Brendo Brito and Jurandir Melo (UFAPE, Brazil); Carlos Melo (Universidade de Pernambuco, Brazil & Universidade Federal de Sergipe, Brazil); Raquel Trajano (UFPE, Brazil); Jamilson Dantas (University Federal of Pernambuco & UFPE, Brazil); Jean Araujo (Universidade Federal Do Agreste de Pernambuco, Brazil)

9:10 ***Low-Complexity Diffusion Adjoint Least Mean Squares Algorithm for Multi-Device Node-Based Distributed Active Noise Control Systems***
Adilkhan Urazalin and Muhammad Tahir Akhtar (Nazarbayev University, Kazakhstan)

9:30 ***Learned Super-Resolution as a Low-Bitrate Image Compression Mechanism for Multimedia Systems***
Paul Gaynor (The University of the West Indies, Mona Campus, Jamaica)

9:50 ***A Unified Web Architecture for Secure and Scalable Fiber-Optic Sensing System Management***
Kamran Bashir Taas (University of Missouri - Columbia, USA); Amjad F. Hasan (University of Missouri Columbia, USA); Mai Abuhelwa (University of Missouri, USA); Mohammed Almalaysha (University of Missouri Columbia, USA); Adheesha Bandara and Jacob Mack (University of Missouri, Columbia, USA); Prakash Dadi (University of Missouri, Saint Lious, USA); Azlin Mustapha and Mahmoud Almasri (University of Missouri, Columbia, USA); Vijay Anand (Kennesaw State University, USA)

10:10 - 10:40
Thursday AM Break

10:40 - 12:00
R2A: Performance, Optimization, and Education
Room: Acadia A
Chair: Yazan Youssef (Queen's University, Canada)

10:40 ***Accuracy-Adaptive Speedup of Indirect Optimization Heuristics***
Mehreen Khan (TU Ilmenau, Germany); Armin Zimmermann (Ilmenau University of Technology & Systems and Software Engineering, Germany)

11:00 ***A Hetero-functional Network Minimum Cost Flow Formulation to Resource Constrained Project Scheduling***
Amirreza Hosseini and Amro M. Farid (Stevens Institute of Technology, USA)

10:40 - 12:00
R2B: Specialized Communication and Signal Processing
Room: Acadia B
Chair: Hazel Griffith (Carleton University, Canada)

10:40 ***CommUnity: A System-of-Systems Framework for Resilient HF/NVIS Amateur Radio Communications***
Xueyicheng Xu (University of Washington, USA & Sensors, Energy, and Automation Laboratory (SEAL), USA); Zheng Liu (University of Washington & Sensors, Energy, and Automation Laboratory, USA); Maxwell Mamishev (University of Illinois Urbana-Champaign, USA); Thomas Tusty, Harris Nakajima and Gokul Nathan (University of Washington, USA); Omnya M (New Jersey Institute of Technology, USA); Sep Makhsous (University of Washington, USA)

11:00 ***Leveraging Pretrained ResNet Architectures for Enhanced Real-Time Bat Counting***
Bayazit Karaman and Benjamin Bowman (Florida Polytechnic University, USA); Laura N. Kloepper (University of New Hampshire, USA); Ian Bentley (Florida Polytechnic University, USA)

11:20 ***FASTVIS: A Lightweight and Hybrid-Compatible Method for Occlusion Detection in 3D Meshes Using Spherical Geometry***
Amin Khakpour Komarsofla and Meaghan Charest-Finn (Ontario Tech University, Canada); Scott Nokleby (Ontario Technology University, Canada); Joshua Pickard (Eigen Innovations Incorporation, Canada)

10:40 - 12:00
R2C: Special Session: Digitalization and Intelligence-Driven Systems Engineering Methods
Room: Acadia C
Chairs: Nejib Moalla (University Lumiere Lyon 2, France), Tianxiao Xu (Université Lumière Lyon 2, France & IVECO France, France)

10:40 ***Electric Power Load Analysis for All Electric Complex Ships: Methods, Challenges and Opportunities***
Andrea Vicenzutti, Andrea Alessia Tavagnutti, Samuele Sbuelz, Luca Braidotti and Giorgio Sulligoi (University of Trieste, Italy)

11:00 ***Applying Model-Based Risk Management to a Representative Unmanned Maritime System***
David C Gross and Carmen Araujo (Florida State University, USA); Daniel N. Horn (TDI Technologies, Inc, USA); Naqash Ali, Matthew Bosworth and Christina Kalantzi (Florida State University, USA)

Virtual Presentations (CONFlux Only)
Registrants can access video presentations in the mobile app and submit questions directly to the authors through the platform.

The 8th Special Session: Aerospace Systems, Adaptive Systems and AI III

Predictive Quality Engineering in Distributed Data Platforms Using Machine Learning
Jay Bharat Mehta (Cleveland State University, Alumni, USA)

SAE: Subgraph-Aware Edge Classification Framework for Monitoring Suspicious Financial Transactions in Anti Money Laundering Environments
Rejuana Sushmi, Maisha Alam Mim, Sadia Islam and Raqeebir Rab (Ahsanullah University of Science and Technology, Bangladesh); Abderrahmane Leshob (University of Quebec at Montreal, Canada); Ashikur Rahman (University of Alberta, Canada)

Laser-Guided Control for Multicopter UAVs: Preliminary Design and Testing
Ruaa Nakkar (King Fahad University of Petroleum and Minerals, Saudi Arabia); Hassan Abid (King Fahd University of Petroleum & Minerals (KFUPM), Saudi Arabia); Syed Saad Azhar Ali (King Fahd University of Petroleum & Minerals & Interdisciplinary Research Center for Smart Mobility and Logistics, Saudi Arabia); Mohamed Ismail (King Fahad University of Petroleum and Minerals, Saudi Arabia)

Meta-Heuristic UAV path planning in Spherical Coordinates
Ruaa Nakkar (King Fahad University of Petroleum and Minerals, Saudi Arabia); Muhammad Mysorewala (King Fahd University of Petroleum & Minerals, Saudi Arabia)

Avoiding the Knowledge-Graph-on-Hot-Path Anti-Pattern: A Separation-of-Truth Architecture for Real-Time COP in Battlefield Simulation
Nguyen Huy Liem (Le Quy Don University, Vietnam); Thai Truong Son (National Defense Academy of Japan, Japan); Hiroshi Sato and Masao Kubo (National Defense Academy, Japan); Phung The Bao (Ho Chi Minh City University of Industry and Trade, Vietnam); Tran Quang Dung (Le Quy Don Technical University, Vietnam)

Special Session: Digitalization and Intelligence-Driven Systems Engineering Methods (Virtual)

Cognitive digital thread supporting agile reuse of knowledge in model-based systems engineering
Jiaxing Qiao (Beijing Insititute of Technology, China); Guoxin Wang and Shouxuan Wu (Beijing Institute of Technology, China); Jinzhi Lu (Beihang University, China); Haoxuan Zhang and Jianyu Huang (Beijing Insititute of Technology, China)

A Formal Verification Approach for Measures of Effectiveness Based on Satisfiability Modulo Theories
Yongji Yuan, Guoxin Wang and Yihui Gong (Beijing Institute of Technology, China); Jinzhi Lu (Beihang University, China); Shouxuan Wu and Mengru Dong (Beijing Institute of Technology, China)

Application or Research Papers

Benchmarking Encoder-Decoder and Decoder-Only Models for Extremely Low-Resource English to Myaamia Translation
Yogesh Chaudhary (Miami University, USA); Suman Bhunia (Miami University, Ohio, USA); Arthur Carvalho (Miami University, Farmer School of Business, USA); Doug Troy (Miami University, USA)

Modular Landfill Remediation for AI Grid Resilience
Qi He (Google, USA); Chunyu Qu (Dun & Bradstreet Inc., USA)

Explainable Multitask Graph Network for Blood Glucose Forecasting and Hypoglycemia Risk Classification
Muhammad Abdullah Sarwar (Kaunas University of Technology (KTU), Lithuania); Sarmad Maqsood (Kaunas University of Technology, Lithuania); Ali Amini (Kaunas University of Technology (KTU), Lithuania); Irfan Abbas (Kaunas Technology University, Lithuania); Egle Belousoviene (Lietuvos Sveikatos Mokslų Universitetas, Lithuania); Rytis Maskeliunas (Kaunas University of Technology, Lithuania)

UrbanTrunkSegNet: An Enhanced Deep Learning Approach to Individual Tree Trunk Segmentation for Urban Forest Inventory
Irfan Abbas (Kaunas Technology University, Lithuania); Muhammad Abdullah Sarwar (Kaunas University of Technology (KTU), Lithuania); Ali Amini and Rytis Maskeliunas (Kaunas University of Technology, Lithuania); Izabela Karsznia (Warsaw University, Poland); Robertas Damaševicius (Kaunas University of Technology, Lithuania)

Model-Free Health Monitoring of Multirotor UAVs Using Frequency-Response Analysis
Sherif Hassan Aly Ahmed and Mohammad salem Albaraj (King Fahad University of Petroleum and Minerals, Saudi Arabia); Ramy Rashad (King Fahd University of Petroleum & Minerals, Saudi Arabia); Zeashan Hameed Khan (IRC-IMR, KFUPM, Saudi Arabia); Mohamed Ismail (King Fahad University of Petroleum and Minerals, Saudi Arabia)

High-Order PI Control Tuning for Multicopter UAVs Using Ant Colony Optimization
Mohammad salem Albaraj and Mohamed Ismail (King Fahad University of Petroleum and Minerals, Saudi Arabia); Md Ismail Hossain (King Fahd University of Petroleum and Minerals, Saudi Arabia); Essam M. Shaban (Jazan University, Saudi Arabia)

Product Design as Technology Management: Developing a Solar-Powered Diagnostic Device for Resource-Limited Environments
Rianna Smith and Sasha-Gay Wright (University of the West Indies Mona, Jamaica); Davaugh Sanderson (University of the West Indies Mona, Jersey); Cesar Viloria-Nuñez (Universidad Tecnológica de Bolívar, Colombia); Ali Yetisen (Imperial College, United Kingdom (Great Britain)); Ángel Pinto (Universidad del Sinu, Colombia)

Integrating Artificial Intelligence into System Security Engineering Design: Enhancing Efficiency and Security
Mehrdad S. Sharbaf (Sharbaf and Associates LLC, USA)

Scalable Counterfactual Explanations for Large-Scale Automated Decision Systems
Priya T V and Shrisha Rao (International Institute of Information Technology, Bangalore, India)

End-to-End Secure Federated Learning for Cross-Client Credit Card Fraud Detection
Freddie Faulkner (Anglia Ruskin University, United Kingdom (Great Britain)); Amar Patra (Radford University, USA); Raj Mani Shukla (Anglia Ruskin University, United Kingdom (Great Britain)); Suman Bhunia (Miami University, Ohio, USA)

Analyzing Road Network Inefficiency via Simulation: Towards a MARL Evaluation Testbed
Shima Rahmani (Trinity College Dublin (TCD), Ireland); Mélanie Bouroche and Brian Caulfield (Trinity College Dublin, Ireland); Ivana Budinská (Slovak Academy of Sciences, Slovakia)

Language-Agnostic Reverse Engineering of Software into SysML v2 via LLM Reasoner
Richard Qualis (Florida Institute of Technologies, USA); Carlos Otero and Adrian Peter (Florida Institute of Technology, USA)

Improving the System Requirement Engineering Process with Artificial Intelligence
Walt Melo (Georgetown University, USA & MITRE, USA)

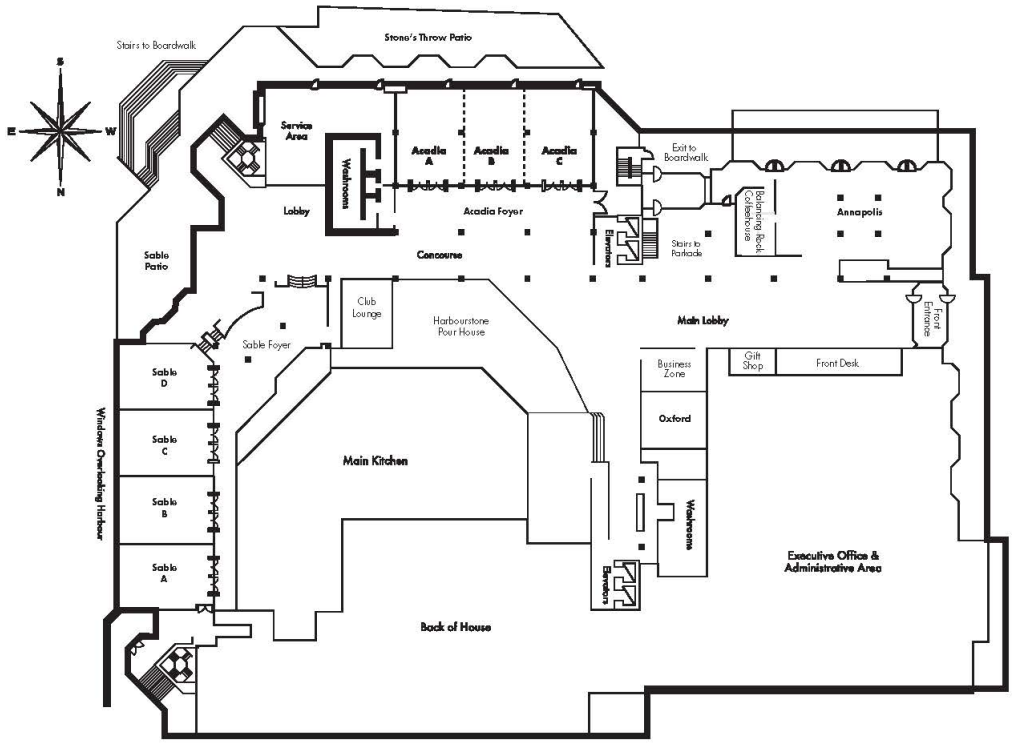
Enhancing the MBSE Process with Agentic AI
Walt Melo (Georgetown University, USA & MITRE, USA)

ML-based Medical Diagnostics System for Infectious Diseases (Case Study: COVID-19)
Sanjay Manda, Siddhartha Vinnakota, Manohar Adapa, Bindu Chandra Shekar Reddy, Akanksha Ojha and Bonaventure Chidube Molokwu (California State University, Sacramento, USA)

Interpretable and Explainable AI for Predicting Systems Thinking Skills
Saroj Raut (The University of Texas at El Paso, USA); Fazla Rabbi (Arkansas State University, USA); Niamat Ullah Ibne Hossain (The University of Texas at El Paso, USA); Jaradat (Khalifa University, United Arab Emirates); Alex Gorod (The University of Adelaide, Australia); Randy Buchanan (ERDC, USA)

Floorplans

GROUND FLOOR



SECOND FLOOR