

# **2023 IEEE International Systems Conference (SysCon 2023)**

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**Monday, April 17**

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**8:00**

**Registration Opens**

**Room: Kitsilano Prefunction**

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**13:00 – 14:45**

**Tutorial: Arcadia and Capella Discovery**

**Room:** Fairview III

**Presenter:** Stephane Lacrampe (ObeoSoft Canada Inc, Canada)

**13:00 – 14:45**

**Tutorial: Complex Simulation Trustworthiness: What are Your Simulation Needs?**

**Room:** Fairview IV

**Presenter:** Henri Sohier (IRT SystemX, France)

**13:00 – 14:45**

**Tutorial: Structured Assurance Cases for Autonomous Systems**

**Room:** Fairview V

**Presenter:** Simon Diemert (Critical Systems Labs Inc., Canada)

Jeffrey Joyce (Critical Systems Labs Inc., Canada)

Ehsan Ghahremani (Critical Systems Labs Inc., Canada)

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**14:45 – 15:15**

**Break**

**Kitsilano Prefunction**

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**15:15 – 17:00**

**Tutorial: Arcadia and Capella Discovery (Continued)**

**Room:** Fairview III

**Presenter:** Stephane Lacrampe (ObeoSoft Canada Inc, Canada)

**15:15 – 17:00**

**Tutorial: Complex Simulation Trustworthiness: What are Your Simulation Needs? (Continued)**

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**Presenter:** Henri Sohier (IRT SystemX, France)

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**Tutorial: Structured Assurance Cases for Autonomous Systems (Continued)**

**Room:** Fairview V

**Presenter:** Simon Diemert (Critical Systems Labs Inc., Canada)

Jeffrey Joyce (Critical Systems Labs Inc., Canada)

Ehsan Ghahremani (Critical Systems Labs Inc., Canada)

Tuesday, April 18

7:30 - 8:30

Refreshments & Registration  
Room: Kitsilano Prefunction

8:30 - 10:00

Welcome & Keynote Speaker

Transitioning from DE Strategy and Research into Implementation: Enablers and Challenges

(Dr. Dinesh Verma, Systems Engineering Research Center (SERC), Acquisition Innovation Research Center (AIRC) & Stevens Institute of Technology)

Room: Kitsilano ABC

10:00 - 10:30

Break

Room: Kitsilano Prefunction

10:30 - 12:00

2B1: Artificial Intelligence and Machine Learning

Room: Fairview II

Chair: Sidney Givigi (Queen's University, Canada)

**10:30 Continuous Action Learning Automata Optimizer for training Artificial Neural Networks...1**

James Lindsay (Royal Military College of Canada, Canada)

Sidney Givigi (Queen's University & Royal Military College of Canada, Canada)

**11:00 Predicting Litecoin price movement in a pre-defined trading volume window using Random Forest model...8**

Guilherme Palazzo (Aeronautics Institute of Technology, Brazil & Quantique M3 Investments LTDA, Brazil)

Michel Leles (Universidade Federal de São João Del-Rei, Brazil)

Elton Felipe Sbruzzi (Aeronautics Institute of Technology, Brazil)

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

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Shayan Sheikhezai (California State University, Long Beach, USA)

Sean (Seok-Chul) Kwon (California State University Long Beach, USA)

Hen-Geul Yeh (California State University Long Beach, USA)

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Room: Fairview III

Chair: Paul C. Hershey (Raytheon Technologies, USA)

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Paul C. Hershey (Raytheon Technologies, USA)

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Jeremy Daily (Colorado State University, USA)

Amy Eddy (Colorado State University & Air Force, USA)

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John Colombi (Air Force Institute of Technology, USA)

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Tuesday, April 18

10:30 - 12:00

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*John Caddell (Stevens Institute of Technology & US Army, USA)*

*Roshanak Rose Nilchiani (Stevens Institute of Technology, USA)*

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*Alicia Ruvinsky (USACE ERDC, USA)*

*Maria Seale (United States Army Engineer Research and Development Center (ERDC) & Information Technology Laboratory, USA)*

*Edward Perkins (US Army Engineer Research and Development Center, USA)*

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Room: Fairview V

Chair: Brian Lachine (Royal Military College of Canada, Canada)

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*Helber Wagner Da Silva (Federal Institute of Rio Grande do Norte, Brazil)*

*Marco Vieira (University of Coimbra, Portugal)*

*Augusto J. Venancio Neto (Federal University of Rio Grande do Norte (UFRN), Brazil & Instituto de Telecomunicações Aveiro, Portugal)*

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Room: Kitsilano ABC

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*Sergio Luna Fong (The University of Texas at El Paso, USA)*

**Tuesday, April 18**

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*Mary Ann Gaal (Florida Institute of Technology, USA)*

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*Steffen Wagenmann (Karlsruher Institute of Technology & TRUMPF Machine Tools SE & CoKG, Germany) Fabio*

*Reichert (Karlsruhe Institute of Technology, Germany)*

*Constantin Mandel (Karlsruhe Institute of Technology (KIT), Germany)*

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

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**13:30 - 15:00**

**2C2: System Architecture I**

**Room: Fairview III**

**Chair: John Colombi (Air Force Institute of Technology, USA)**

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*Thomas Bechtel-Weber (University of Siegen, Germany)*

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**2C3: Modeling and Simulation I**

**Room: Fairview IV**

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

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*Sidney Givigi (Queen's University & Royal Military College of Canada, Canada)*

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*Guilherme Palazzo (Aeronautics Institute of Technology, Brazil & Quantique M3 Investments LTDA, Brazil)*

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*Ulrich Dahmen (RWTH Aachen University, Germany)*

*Tobias Osterloh (RWTH Aachen University, Germany)*

*Jürgen Roßmann (RWTH Aachen University, Germany)*

**Tuesday, April 18**

**13:30 - 15:00**

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**Room: Fairview V**

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*Deepak K Tosh (University of Texas, El Paso, USA)*

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*Newton Carlos Will (Federal University of Technology - Parana, Brazil)*

*Rafael Obelheiro (UDESC, Brazil)*

*Carlos A Maziero (Federal University of Parana State - UFPR, Brazil)*

**15:00 - 15:30**

**Break**

**Room: Kitsilano Prefunction**

**15:30 - 17:00**

**2D1: Decision-Making for Complex Systems I**

**Room: Fairview II**

**Chair: Raymond K Jonkers (Merlantec Management and Engineering, Canada)**

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

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*Sebastian Beckschulte (Laboratory for Machine Tools and Production Engineering WZL of RWTH Aachen University, Germany)*

*Marcos Padrón (Laboratory for Machine Tools and Production Engineering WZL of RWTH Aachen Univ, Germany)*

*Quoc Hao Ngo (Neuman and Esser Group, Germany)*

*Robert H. Schmitt (Laboratory for Machine Tools and Production Engineering WZL of RWTH Aachen Univ, Germany)*

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*Gabriel Torres de Jesus (Instituto Nacional de Pesquisas Espaciais (INPE), Brazil)*

*Irineu Yassuda (IFSP - Federal Institute of Education, Science and Technology of Sao Paulo, Brazil)*

*Marcos Nóbrega (Petróleo Brasileiro S.A. (Petrobras), Brazil)*

*Feliciano Silva (Petróleo Brasileiro S.A. (Petrobras), Brazil)*

*Pedro Sousa (Petróleo Brasileiro S.A. (Petrobras), Brazil)*

*Hugo F. L. Santos (Petróleo Brasileiro SA Petrobras, Brazil)*

Tuesday, April 18

15:30 - 17:00

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Room: Fairview III

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*Holly Handley (Old Dominion University, USA)*

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*Brovar (Skolkovo Institute of Science and Technology, Russia)*

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*François Blanchard (Ecole de Technologie Supérieure, Canada)*

*Clement Fortin (Skolkovo Institute of Science and Technology, Russia)*

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

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*André Marcorin de Oliveira (Federal University of Sao Paulo, Brazil)*

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*Bach Tran (University of Akron, USA)*

*Vinh Tran (University of Massachusetts Lowell, USA)*

*Kimseng Soth (University of Massachusetts Lowell, USA)*

*Charles Thompson (Umass Lowell, USA)*

*Susan Tripathy (University of Massachusetts Lowell, USA)*

*Kavitha Chandra (University of Massachusetts Lowell, USA)*

*Shivakumar Sastry (University of Akron, USA)*



**Tuesday, April 18**

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*Guoxin Wang (Beijing Institute of Technology, China)*

*Shouxuan Wu (Beijing Institute of Technology, China)*

*Jinzhi Lu (École Polytechnique Fédérale de Lausanne, Switzerland)*

*Yan Yan (Beijing Institute of Technology, China)*

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**17:30 - 19:00**

**Reception**

**Room: Kitsilano Prefunction**

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**19:00 - 20:30**

**Young Professionals Meeting**

**Room: Fairview V**

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Wednesday, April 19

7:30 - 8:00

Refreshments & Registration

Room: Kitsilano Prefunction

8:00 - 9:30

3A2: Decision-Making for Complex Systems II

Room: Fairview III

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*Dustin Crayton (University of Virginia, USA)*

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

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*Stanislav Gankov (Southwest Research Institute, USA)*

*Walter D. Downing, Jr. (Southwest Research Institute, USA)*

*Joshua Alden (Southwest Research Institute, USA)*

*Sankar Bharathi Rengarajan (Non Profit R&D & Southwest Research Institute, USA)*

*Scott R. Hotz (Southwest Research Institute, USA)*

*Piyush Bhagdikar (Southwest Research Institute, USA)*

Wednesday, April 19

8:00 - 9:30

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Room: Fairview V

Chair: Haifeng Zhu (Boeing, USA)

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*Andrew McDermott (Boeing, USA)*

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*Mingrui Yu (University of Calgary, Canada)*

*Henry Leung (University of Calgary, Canada)*

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*Yaniv Mordecai (Tel Aviv University)*

*Avner Engel (Tel Aviv University, Israel)*

9:30 - 10:00

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Room: Kitsilano Prefunction

10:00 - 12:00

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Room: Fairview III

Chair: Walter D. Downing, Jr. (Southwest Research Institute, USA)

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*Sanja Lazarova-Molnar (Karlsruhe Institute of Technology, Germany & University of Southern Denmark, Denmark)*

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

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*Venkata Rajesh Chundru (Southwest Research Institute, USA)*

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*Venkata Rajesh Chundru (Southwest Research Institute, USA)*

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*Bapiraju Surampudi (Southwest Research Institute, USA)*

*Jayant Sarlashkar (Southwest Research Institute, USA)*

*Walter D. Downing, Jr. (Southwest Research Institute, USA)*

Wednesday, April 19

10:00 - 12:00

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Chair: Jameela Al-Jaroodi (Robert Morris University)

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Nader Mohamed (Pennsylvania Western University & Middleware Technologies Lab., USA)

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Imad Jawhar (Al Maaref University, Lebanon)

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Shubhangi Gawali (BITS PILANI GOA CAMPUS, INDIA, India)

Clement E. Onime (International Centre for Theoretical Physics, Italy)

Neena Goveas (BITS Pilani K K Birla Goa Campus, India)

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Imad Jawhar (Al Maaref University, Lebanon)

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Gong Zhou (Technical Systems Integration, USA)

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Parth Ganeriwala (Florida Institute of Technology, USA)

Randolph M Jones (Soar Technology, USA)

Siddhartha Bhattacharyya (Florida Institute of Technology, USA)

Michael Matessa (Rockwell Collins, USA)

Jennifer Davis (Collins Aerospace, USA)

Hemant Purohit (Florida Institute of Technology, USA)

Simone Fulvio Rollini (Collins Aerospace, USA)

Wednesday, April 19

12:00 - 13:30

Lunch

Room: Kitsilano ABC

13:30 - 15:00

3D2: Robotic Systems

Room: Fairview III

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*Sidney Givigi (Queen's University & Royal Military College of Canada, Canada)*

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*JiaJia Liu (Zhejiang University, China)*

*Zheng Chen (Zhejiang University)*

*Jason Gu (Dalhousie University, Canada)*

13:30 - 15:00

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*Stanislav Gankov (Southwest Research Institute, USA)*

*Jayant Sarlashkar (Southwest Research Institute, USA)*

*Sankar Bharathi Rengarajan (Non Profit R&D & Southwest Research Institute, USA)*

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*Christian Wietfeld (TU Dortmund University, Germany)*

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*Sergio Luna Fong (The University of Texas at El Paso, USA)*

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Room: Fairview V

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**Wednesday, April 19**

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*Gabriel Torres de Jesus (Instituto Nacional de Pesquisas Espaciais (INPE), Brazil)*

*Milton de Freitas Chagas Júnior (Instituto Nacional de Pesquisas Espaciais (INPE), Brazil)*

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**15:00 - 15:30**

**Break**

**Room: Kitsilano Prefunction**

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**15:30 - 17:00**

**3E2: Sensors Integration and Applications**

**Room: Fairview III**

**Chair: Thomas M Booth (Colorado State University, USA)**

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**15:30 Application of Automated Quality Control in Smart Factories - A Deep Learning-based Approach...449**

*Subbalakshmi M (Independent Researcher, USA)*

*Catalina Diaz (University of Texas Rio Grande Valley, USA)*

*Hasbanny Irisson (University of Texas Rio Grande Valley, USA)*

*Aditya Akundi (University of Texas at Rio Grande Valley, USA)*

*Viviana Lopez (University of Texas Rio Grande Valley, USA)*

*Douglas Timmer (University of Texas Rio Grande Valley, USA)*

**16:00 A Gradient Descent Multi-Algorithm Grid Search Optimization of Deep Learning for Sensor Fusion...457**

*Thomas M Booth (Colorado State University & United States Air Force, USA)*

*Sudipto Ghosh (Colorado State University, USA)*

**16:30 Blockchain health sensor network performance analysis on low powered microcontroller devices...465**

*Kithmini Rathnagee Godawatte Godawatte Arachchige (Swinburne University of Technology, Australia)*

*Philip Branch (Swinburne University of Technology, Australia)*

*Jason But (Swinburne University, Australia)*

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**15:30 - 17:00**

**3E3: Unmanned and Autonomous Systems**

**Room: Fairview IV**

**Chair: Pierre de Saqui-Sannes (ISAE-SUPAERO, Université de Toulouse, France)**

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**15:30 Applying a Model-Based Systems Engineering Approach to Model an Unmanned Aerial Vehicle Mission...473**

*Anthony Abi Badra (ISAE-SUPAERO, France)*

*Ombeline Aiello (ISAE-SUPAERO & ONERA, France)*

*Jean-Charles Chaudemar (ISAE-SUPAERO, France)*

**16:00 Modeling UAS Flight Procedures for SORA Safety Objectives...480**

*Charles A Mathou (ISAE-SUPAERO, France)*

*Pierre de Saqui-Sannes (ISAE-SUPAERO, Université de Toulouse, France)*

*Jean-Charles Chaudemar (ISAE-SUPAERO, France)*

*Kevin Delmas (ONERA, France)*

Wednesday, April 19

15:30 - 17:00

**3E4: Cloud Computing and Systems of Systems**

**Room: Fairview V**

**Chair: Jeffrey S Chavis (Johns Hopkins University Applied Physics Laboratory, USA)**

**15:30 Architecting an Enterprise-of-Enterprises with the 10 Layer Rubric: Transforming EoE Decision-Making...488**

*Jeffrey S Chavis (Johns Hopkins University Applied Physics Laboratory, USA)*

*Jeffrey Osborn (Johns Hopkins University Applied Physics Laboratory, USA)*

*Daniel P Syed (Johns Hopkins University Applied Physics Laboratory, USA)*

*Reginald Terrell (Johns Hopkins University Applied Physics Laboratory, USA)*

**16:00 Thirteen concepts to play it safe with the cloud...496**

*Teun Hendriks (TNO-ESI & Teatownlake, The Netherlands)*

*Benny Akesson (TNO, The Netherlands)*

*Jeroen Voeten (ESI / TU/e, The Netherlands)*

*Martijn Hendriks (Eindhoven University of Technology, The Netherlands)*

*Javier Coronel Parada (Instituto Tecnológico de Informática, Spain)*

*Miguel García-Gordillo (Instituto Tecnológico de Informática, Spain)*

*Sergio Sáez (Instituto Tecnológico de Informática, Spain)*

*Joan J. Valls (Instituto Tecnológico de Informática, Spain)*

**16:30 Predictive Auto-scaler for Kubernetes Cloud...503**

*Simon Shim (San Jose State University, USA)*

*Ankit Dhokariya (San Jose State University, USA)*

*Varun Patwari (San Jose State University, USA)*

*Sarvesh Upadhye (San Jose State University, USA)*

*Devangi Doshi (San Jose State University, USA)*

*Ji-Yong Park (Korea Internet and Security Agency, Korea (South))*

18:00 - 19:30

**Women in Systems Engineering (WiSE) Reception**

**Room: Honey Salt**

Thursday, April 20

7:30 - 8:00

Refreshments & Registration

Room: Kitsilano Prefunction

8:00 - 9:30

4A2: System Architecture III

Room: Fairview III

Chair: Martin Sommer (Karlsruhe Institute of Technology, Germany)

**8:00 Architecture Design of the Anti-Aircraft System Based on Architecture Framework...511**

*Qingsong Zhao (National University of Defense Technology, China)*

*Qihong Chen (College of Systems Engineering, China)*

*Qunyou Qian (College of Systems Engineering, China)*

*Han Zhao (College of Systems Engineering, China)*

**8:30 Bayesian Models for Node-Based Inference Techniques...516**

*Nazia Sharmin (University of Texas at El Paso, USA)*

*Christopher Kiekintveld (University of Texas at El Paso, USA)*

*Jaime C Acosta (DEVCOM Army Research Laboratory, USA)*

*Aron Laszka (Pennsylvania State University, USA)*

*Shanto Roy (University of Houston & Institute of Electrical and Electronics Engineers (IEEE), USA)*

**9:00 Ontology for Vehicle Function Distribution...524**

*Jan Ruhnau (University of Stuttgart & Mercedes-Benz AG, Germany)*

*Martin Sommer (Karlsruhe Institute of Technology, Germany)*

*Jacqueline Henle (FZI Research Center for Information Technology, Germany)*

*Alexander Walz (Mercedes-Benz AG, Germany)*

*Steffen Becker (University of Stuttgart, Germany)*

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

8:00 - 9:30

4A3: Systems Integration

Room: Fairview IV

Chair: Jefferson Silveira (Queen's University, Canada)

**8:00 System Design and Performance Analysis of Indoor Real-time Localization using UWB Infrastructure...530**

*Jonathan Plangger (Carleton University, Canada)*

*Hariprasadh Govindasamy Ravichandran (Carleton University, Canada)*

*Sarat Chandran Rodin (Carleton University, Canada)*

*Mohamed Atia (Carleton University & Queen's University, Canada)*

**8:30 System for Continuous Multi-Dimensional Mobile Network KPI Tracking and Prediction in Drifting Environments...538**

*Hendrik Schippers (TU Dortmund University, Germany)*

*Stefan Böcker (TU Dortmund University, Germany)*

*Christian Wietfeld (TU Dortmund University, Germany)*

**9:00 Modelling of Virtual Sensors for Manufacturing Process using Gradient Boosting Technique...544**

*Bruno Vilela Souza (Federal University of Sao Paulo, Brazil)*

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

*André Marcorin de Oliveira (Federal University of Sao Paulo, Brazil)*

*Sidney Givigi (Queen's University & Royal Military College of Canada, Canada)*



Thursday, April 20

8:00 - 9:30

**4A4: Modeling and Simulation III**

**Room: Fairview V**

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

**8:00 Challenges and Opportunities in the Digital Engineering Simulation Curriculum Development...552**

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

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

*Megan Clifford (Stevens Institute of Technology, USA)*

*Geoffrey Kerr (Virginia Polytechnic Institute and State University, USA)*

*Peter Beling (University of Virginia, USA)*

*Tim Sherburne (Virginia Tech, USA)*

*Paul Wach (Virginia Tech, USA)*

*David Long (Vitech, USA)*

*Craig Arndt (GTRI, USA)*

*Dinesh Verma (Stevens, USA)*

*Thomas A McDermott, Jr (Stevens Institute of Technology, USA)*

**8:30 Dependability Issues on an Internet Service Provider and availability study of autonomous systems...559**

*Arthur Sérgio (Universidade Federal de Pernambuco, Brazil)*

*Felipe Oliveira (Universidade Federal de Pernambuco, Brazil)*

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

*Daliton Silva (Universidade Federal de Pernambuco, Brazil)*

*Danilo Clemente (Universidade Federal de Pernambuco, Brazil)*

**9:00 Efficient Coverage Methods for Earth Observing Tradespace Analysis...566**

*I. Josue Tapia-Tamayo (Stevens Institute of Technology, USA)*

*Paul T Grogan (Stevens Institute of Technology, USA)*

9:30 - 10:00

**Break**

**Room: Kitsilano Prefunction**

10:00 - 11:30

**4B2: Intelligent Systems**

**Room: Fairview III**

**Chair: Albert Wong (Langara College, Canada)**

**10:00 Forecasting of Stock Prices Using Machine Learning Models...574**

*Albert Wong (Langara College, Canada)*

*Juan Figini (Langara College, Canada)*

*Amatul Raheem (Langara College, Canada)*

*Gaétan J. D. R. Hains (Université Paris-Est Creteil (UPEC), France)*

*Youry Khmelevsky (Okanagan College, Canada)*

*Pak Chu (Langara College, Canada)*

**10:30 Design parameter exploration for community-based flood early warning system with dynamic probabilistic performance assessment approach...581**

*Yuki Tomita (Keio University, Japan)*

*Naohiko Kohtake (Keio University, Japan)*

**11:00 Local Energy Local Marketplace Agents-based Analysis...589**

*Ameni Boumaiza (ALRAYYAN & QEERI, Qatar)*

Thursday, April 20

10:00 - 11:30

**4B3: Model-Based Systems Engineering II**

Room: Fairview IV

Chair: Arturo Jose Davila-Andino (George Mason University, USA)

**10:00 Employing UAF Inter-Domain Traceability for Performance and Effectiveness Evaluation...594**

*Ahmad Alghamdi (University of Jeddah, USA & George Mason University, USA)*

*Mohammadreza Torkjazi (George Mason University, USA)*

*Arturo Jose Davila-Andino (George Mason University, USA)*

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

**10:30 Use of Natural Language Processing in Digital Engineering Context to Aid Tagging of Model...602**

*Daniel Dunbar (Stevens Institute of Technology, USA)*

*Maximilian Vierlboeck (Stevens Institute of Technology, USA)*

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

**11:00 Risk Description Augmenting a Business Process Model...610**

*DeAndre A Johnson (University of Virginia, USA)*

*James H. Lambert (UVA, USA)*

*Rayshaun L Wheeler (University of Virginia, USA)*

10:00 - 11:30

**4B4: Virtual Session**

Room: Fairview V

Chair: TBA

**10:00 Counterfeit Detection in the e-Commerce Industry Using Machine Learning: A Review...617**

*Jay Gohil (School of Technology, India)*

*Rasha Kashef (Ryerson University, Canada)*

**10:30 FPGA Implementation of Multi-RT Protocol for Avionics Simulation...625**

*Pillutla Narasimhulu (Hyderabad & Indian Institute of Technology (IIT), Hyderabad, India)*

**11:00 An Ensemble-Based ML Approach for Fault Detection & Classification in Transmission Lines...629**

*Muhammad Hayyan Bin Shahid (Ontario Tech University, Canada)*

*Akramul Azim (Ontario Tech University, Canada)*