



INTERNATIONAL COUNCIL FOR SYSTEMS ENGINEERING

The world's authority on Systems Engineering

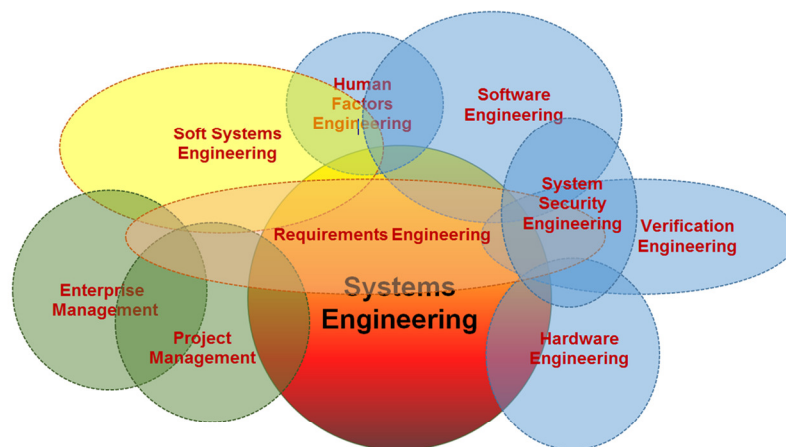
CONSEIL INTERNATIONAL D'INGÉNIERIE SYSTÈME

INCOSE est l'autorité mondiale en ingénierie système

INCOSE **CANADA** CHAPTER PRESENTS

"MODERN CHALLENGES IN SYSTEMS ENGINEERING"

Presentations from Industry, Government & Academia



uOttawa

Faculté de génie
Faculty of Engineering

University of Ottawa

25-26 November, 2016

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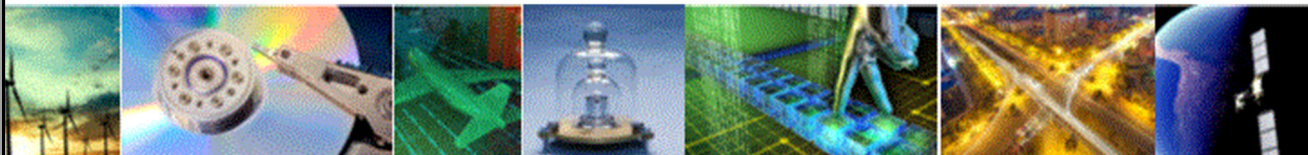
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About INCOSE Canada Chapter



Mission: Share and promote the best practices of systems engineering for the benefit of chapter members and local communities of Canada.

Vision: Being the hub of systems engineering expertise in Canada.

The need to manage complexity and change is now common place in almost all fields of undertaking. Both government and industry need to better address the development and sustainment of complex systems for aerospace, defence, energy, infrastructure, telecommunications, and transport to name a few. Systems engineering provides the essential framework, methods and tools required to solve complex problems and to develop and sustain complex systems. Academia and government need to better prepare (train, sustain) the workforce to deal with these real-life challenges. Annual INCOSE events in Ottawa started in 2012, and in our 5th year we are using the momentum gained to form a national chapter of INCOSE for Canada.

What can you get from joining us in INCOSE Canada?

These are open events, you do not need to be a member of INCOSE, but we encourage you to consider the benefits of INCOSE membership.

Personal and professional development

- Share the challenges you face in a friendly risk-free environment with like-minded professionals.
- Demonstrate your potential, take one of our many opportunities to participate or take the lead within the chapter or its program.

Networking

- Do you want to expand your professional network to systems engineers from the private, public, and academic sectors?
- Are you looking for a place to share ideas, views and challenges, not just in systems engineering, but in systems engineering in Canada?

Citizenship

- Are you looking for an opportunity to give something back to engineering?

If you are interested in joining us, please contact incose.canada@gmail.com or visit us at:

- Web: <http://incosecanada.weebly.com/>
- Facebook: <https://www.facebook.com/INCOSE-Canada-Chapter-402481103198121/>
- LinkedIn: <https://www.linkedin.com/groups/3749948>
- Twitter: @INCOSE_Canada

We are looking forward to hearing from you!

If you later have any questions regarding these proceedings, please feel free to email them to us and we will endeavor to get an answer for you: incosecanada.programs@gmail.com

Friday, November 25

7:45 - 8:30	Registration and Networking. Location: FSS 1 st floor, main lobby			
	Workshop 1: Model-Based Systems Engineering (MBSE)	Workshop 2: In Service Support (ISS) - Sustainability	Workshop 3: System Security Engineering / Workshop 4 IoT Hands On	Workshop 5: Specialty Engineering Integration
Location	LMX 242	DMS 3120	FSS 4006	FSS 5028
8h30-10:00	MBSE tutorial	Supportability Engineering: The Engineering of In-Service Support	W3: System Security Engineering	Human Factors Engineering
	Mike Meakin (Thales)	Pat Read, Jonatan Patterson, Frank Hallam (Pennant)	Denis Gendron (INCOSE Canada)	Paul McKay (CMC Esterline)
10:00-10:30	Coffee break – Sponsored by Pennant. Location: FSS 2 nd floor and 4 th floor			
10:30-12:00	MBSE tutorial	ISS/Sustainability Engineering Tools	W4: IoT Hands On	Human Factors Engineering
	Mike Meakin (Thales)	Pat Read, Jonatan Patterson, Frank Hallam (Pennant)	Carlos Ramirez (IBM Canada)	Paul McKay (CMC Esterline)
		Naval Material Assurance (NMA)		
		Stéphane Ricard (DND)		
12:00-13:30	Lunch – Sponsored by IBM Canada. Location: UCU 1 st floor (upstairs) Cafeteria of the University Center. Meal ticket required			
13:30-15:30	MBSE tutorial	Managing Successful Programs, DND Sustainment Initiative, and Performance Based Contracting	W4: IoT Hands On	E3 Safety, Reliability, Maintainability
	Mike Meakin (Thales)	Pierre Demers (DND) and Denis Bertrand (consultant)	Carlos Ramirez (IBM Canada)	Lorne Callies (E3 consultant) Tony Zenga (CMTIGroup) Susan Cox (The SafetyWright)
		Sustaining Alignment through Collaboration; a Relational Benefit		
		LCdr Scott Koshman (DND)		

Saturday, November 26 (Morning). Location: FSS 2005			
8:00 - 9:00	Registration and Networking. Location: FSS 1 st floor, main lobby		
9:00 - 9:10	Welcome and Outline of the Day Maria-Anca Grigoriu (DND)		
9:10 - 9:30	Opening Address Denis Bertrand (President, INCOSE Canada)		
9:30 - 10:30	Keynote Address: Protecting your Organisation and Assets against Corporate Espionage Michel Juneau-Katsuya (President and CEO, The Northgate Group)		
10:30 - 11:00	Coffee break. Location: FSS 1 st floor and 2 nd floor		
11:00 - 12:00	Keynote Address: In-Service Support for the Royal Canadian Navy – The Next Steps Commodore Simon Page (DGMEPM, DND)		
12:00-12:10	Briefing for the lunch and afternoon sessions Maria-Anca Grigoriu (DND)		
Saturday, November 26 (Afternoon)			
12:10-13:30	Lunch – Sponsored by the Faculty of Engineering, University of Ottawa. Location: UCU 1 st floor (upstairs) Cafeteria of the University Center. Meal ticket required		
	Technical Session 1: Internet of Things (IoT) and Model-Based Systems Engineering (MBSE)	Technical Session 2: System Security Engineering (SSE)	Technical Session 3: Systems Requirements and Processes
Location	FSS 2005	FSS 1030	FSS 1007
13:30-15:00	IoT Trends and Developments in the Canadian Market	Strategies for Surviving the Security Arms Race	Developing and implementing systems engineering and project management processes at CSiT - A small Canadian company in public transportation
	Ambrose Chiu (IBM Canada)	Anil Somayaji (CSSL, Carleton University)	Claude Y. Laporte (ÉTS) and Denis Poliquin (CSiT)
	Connected Electric Vehicles in Smart Cities	PEO's Role in the Challenge of Emerging Engineering Disciplines – Specifically, Cyber Security Engineering / Communications Infrastructure Engineering	Evaluating Evolving Requirements Models with URN: Features, Goals, and Scenarios
	Hussein T. Mouftah (University of uOttawa)	Peter M. DeVita (PEO)	Gunter Mussbacher (McGill University)
15:00-15:30	Coffee break		

Saturday, November 26 (Afternoon – Continued)

	Industrial Use of Model-Based Engineering: Lessons Learned and Future Directions	Systems Security Engineering – Providing Mission Assurance to DND	A Standards Based Reference Model Approach for Systems Engineering for Software Intensive Systems
15:30 - 17:00	Francis Bordeleau (Ericsson)	LCdr Marc Lanouette (DND) and Stephen Sterling (DND)	Mark Jennings (DND)
	Open Source System Engineering and Development		Requirements Life Cycle Approach, and Presentation & Quality of Requirements
	Charles Rivet (Zeligsoft)		Denis Bertrand (consultant)
17:00-17:30	Takeaways, Prizes, and Closing Remarks – Rover sponsored by Papyrus IC Location: FSS 2005		
17:45-20:00	Cocktail reception at Café Nostalgica (603 Cumberland)		

Organization Committee

- **Denis Bertrand** (consultant), President, INCOSE Canada
- **Steve Gribbon** (Croyben Aerospace Technology), Vice-President, INCOSE Canada
- **Maria-Anca Grigoriu** (DND), Communications Director, INCOSE Canada
- **Daniel Amyot** (University of Ottawa), Program Director, INCOSE Canada
- **Andy Oldershaw** (National Research Council), Program Director, INCOSE Canada
- **Mike Meakin** (Thales), Membership Director, INCOSE Canada
- **Philippe Kruchten** (University of British-Columbia), Treasurer, INCOSE Canada
- **Lola Meakin** (Oh Lola Events Management)
- **Ray Barton** (Vitesse Re-Skilling Canada)
- **Charles Rivet** (Zeligsoft)
- **John Muir** (retired)
- **Ambrose Chiu** (IBM Canada)
- **Karim Baamar** (DND)
- **Madeleine Bertrand** (University of Ottawa)
- **Aulis Viik** (NavCanada)

Workshop 1: Model-Based Systems Engineering (MBSE)

Friday, Nov. 25, 8:30-15:30. Location: LMX 242

Speaker: Mike Meakin (Thales)

Abstract. Drawing on industry standards such as IEEE 15288 and IEEE 12207 as well as industry best practices, this workshop will recap the Systems Engineering V model and illustrate the application of Model Based Systems Engineering in support of disciplined Systems Engineering. An overview of what constitutes a System Model is provided along with how to construct such a model, including the development and application of use cases, the importance of end to end traceability, the construction of various Views from the model, the striking of baselines as development progresses through its phases and the ability to include testing as part of the System Model. The advantages of modeling techniques over more contemporary techniques will be covered along with potential pitfalls, cautions and lessons learned.



Mike Meakin has more than 20 year's experience as a systems engineer with 16 years in the unmanned systems field. Having worked in the development of unmanned underwater systems while serving as a Combat Systems Engineer in the Canadian Navy, Mr. Meakin continued work in this industry after release by joining CDL Systems.

At CDL Systems, Mr. Meakin was Project Manager for the team developing the control station software for the Shadow 200 UAV that competed in and won the US Army Tactical UAV Competition in 1999. He then continued to lead this team over the course of the subsequent 5 years, during which time the Shadow 200 was fielded into combat and has since accumulated more than 750,000 combat flight hours. The Shadow 200 was inducted in the Smithsonian Air & Space museum and included a sensor control panel for visitors to operate the camera inside the Shadow 200; this is the only piece of unmanned vehicle software on display at the Smithsonian and was developed under Mike's leadership.

In addition to the Shadow 200 development effort, Mike also led the development of:

- The US Army Remote Viewing Terminal for soldiers to directly receive video from Shadow 200;
- The control station for the Shadow 400 maritime UAV; and
- The control station for Hunter Tactical UAV for the Brigade level.

Mike founded InnUVative Systems in 2007 to address the need he recognized for standards compliant solutions to meet the needs of the smaller unmanned systems. Mike served on the Unmanned Systems Canada board from 2006 to 2013, was a member of the STANAG 4586 standards committee from 2009 to 2013, served as vice chair of the NATO Industry Advisory Group Sub-Group 157 tasked with defining the ground station architecture for cross domain interoperability of unmanned systems and established the Working Group for NATO's Unmanned Systems Multi-Domain Control Solution. Mike was a contributing member of the Canadian Air Regulations Advisory Committee (CARAC) in the development of recommended changes to Canadian Air Regulations in support of routine operations of UAS within the Canadian National Air Space.

Mike is currently a Principle Systems Engineer with Thales Canada.

Workshop 2: In Service Support (ISS) – Sustainability

Friday, Nov. 25, 8:30-15:30. Location: DMS 3120

Chair: Denis Bertrand (consultant)

8:30-10:00 Supportability Engineering: The Engineering of In-Service Support

Speakers: Pat Read, Jonathan Patterson, and Frank Hallam (Pennant Canada Limited)

Abstract. Complex engineered systems (such as major defence asset classes/fleets) need to be engineered as complete systems, composed of operating elements and the enabling support elements that are needed to sustain them through often decades-long in-service lives. This supportability engineering of in-service support solutions is a critical part of the overall Systems Engineering effort needed to deliver and sustain these capabilities.

This presentation will introduce supportability engineering within a systems engineering framework and discuss:

- **Engineering FOR Support** of the system's operating elements
- **Engineering OF Support** for the system's enabling support elements
- **Engineering DURING Support** of the total system to sustain and improve it in-service

The Pennant team will also discuss key supportability engineering toolsets, and highlight some of the supportability engineering challenges specific to the in-service phase of the life cycle.

Pennant is a world-leading provider of supportability engineering software tools used in government and industry, particularly in aerospace and defence.



Pat Read has 46 years combined military/industry experience in logistics support, leading Army maintenance workshops, Department of National Defence (DND) Equipment Program Management Directorates and various DND equipment acquisition projects. He developed supportability business process models for DND and the ISO 10303 STEP AP239 PLCS standard. In Pennant, he leads teams enabling supportability for DND equipment managers and projects.

Pat has a BSc (Mech Eng) from the University of Alberta and post-graduate military technical & operational staff training in Canada and the UK. He is a PEng in Professional Engineers of Ontario (PEO); a member of PMI, and SAE; and Past President of the Electrical and Mechanical Engineering Association (EMEA).



Jonathan Patterson Jonathan served 25 years in the Royal Canadian Navy as a Naval Engineering Officer with a career that spanned the breadth of the materiel organization including HMCS ALGONQUIN Engineering Officer, Arleigh-Burque Production Officer (with the USN), Naval Materiel Supportability Manager (NDHQ), and Supportability Engineering Manager for the Halifax Class Modernization Project.

Upon retiring in 2012, Jonathan joined Pennant Canada as the Supportability Engineering Services Manager and is involved with various projects to assist clients achieve their equipment system support and capability objectives.

Jonathan is a graduate of the Royal Military College of Canada with a BEng in Chemical and Material Engineering, and holds a MSc in Reliability and Quality Engineering from the University of Arizona.



Frank Hallam has been with Pennant for 16 years. He is the Product Manager for both OmegaPS Analyzer and OmegaPS and has lead responsibility for the OmegaPS suite in use as part of DNDs DRMIS solution. He is the SAP lead at Pennant, as well as being responsible for evolving solutions to meet emerging market standards and Canadian client needs.

Frank is a Professional Engineer with a Masters in Engineering Science specializing in Information Management. He left the Canadian Navy in 1997 as a Marine Engineer. While serving, with his interest in Information Management, Frank was involved in several key IT projects; three dockyard Maintenance Management Systems and the shore and ship based Configuration Management Information System (CMIS).

10:30-11:00 Supportability Engineering / In-Service Support Tools

Speakers: Pat Read, Jonathan Patterson, and Frank Hallam (Pennant Canada Limited)

11:00-12:00 Naval Materiel Assurance

Speaker: Stéphane Ricard, CD, MSc (DND)

Abstract. The Royal Canadian Navy is in the process of renewing its surface fleet after a long period without any significant acquisition activity. Since the last ship acquisition, over two decades ago, there have been significant resource reductions and fundamental changes to the overall Canadian Defence environment. There is a need to evolve existing materiel management practices and establish a formal and holistic framework for the assurance of naval platform materiel states.

Naval Materiel Assurance is the framework that will provide reasonable assurance that naval platforms are being designed, constructed, procured, maintained and operated to approved standards by suitably qualified and experienced individuals. Ultimately, Naval Materiel Assurance seeks to ensure that naval platforms are safe, environmentally compliant and fit for purpose. The Naval Materiel Assurance Program is being developed using fundamental “Managing Successful Programmes” and “Systems Engineering” concepts and principles.

Stéphane Ricard:



- Completed 23 years of service with the Royal Canadian Navy as a Marine Systems Engineer
- Served as HMCS VANCOUVER’s Engineering Officer during a seven-month deployment to the Persian Gulf on the heels of the 9/11 terrorist attacks
- Served four years as the Supportability Manager and the Deputy Project Manager (Support) in the Canadian Surface Combatant Major Capital Project
- Currently employed as a Section Head within the Maritime Equipment Program Management Division, where he is the Naval Materiel Management System Program Manager and the Naval Materiel Assurance Program Manager
- Obtained a Baccalaureate degree in Mechanical Engineering from the Royal Military College in Kingston, and a Masters degree in Industrial and Systems Engineering from Rutgers University in New Jersey, USA

13:30-14:30 Managing Successful Programs, DND Sustainment Initiative, and Performance Based Contracting

Speaker: Pierre Demers (DND) and Denis Bertrand (Consultant)

Abstract. Managing Successful Programs – Benefits (featuring the new Ottawa Light Rail Transit (LRT) project as a best practice). This project is addressing the long-term transit needs of the City of Ottawa, as well as fulfilling many priorities set out in the City's vision for sustainability: generating significant economic, environmental, cultural and social benefits for the people of Ottawa.

How DND does sustainment has been evolving for a long time. Lessons learned over the past decade with *Optimized Weapon System Management* and the *In-Service Support Contracting Framework* led to the establishment of the Sustainment Initiative (SI) that is evolving the way the Government of Canada approaches and manages defence sustainment.

Performance Based Contracting (PBC) will enable the objective of improved support by changing the contractual focus from outputs to outcomes. More specifically, PBC entails buying performance, or outcomes, that are pertinent to the end user's (war-fighter's) requirements rather than the traditional approach of buying outputs such as individual parts or repair actions.



Pierre Demers currently works for the Major Project Delivery (DGMPD) division, with the Department of National Defence (DND), where he is responsible for the development and implementation of In Service Support (ISS) and Sustainment solutions for air, land and maritime projects. Pierre is also leading DND weapon system projects with the establishment of establishment of long-term, Performance-Based Contracts (PBC), an emerging discipline in Canada, England, Australia, and the USA.

His formal education includes a Bachelor of Engineering (B.Eng) from the Royal Military College (RMC) Kinston and a Master of Science (MSc) in marine engineering at University College London (UCL). Pierre has been a certified professional engineer for more than 30 years.

As a former naval engineer with the Canadian Armed Forces (CAF), Pierre served in various sea and shore positions to maintain and repair the Navy ships and submarines. Pierre has transferred to the public service where he has been providing supportability engineering expertise and guidance to DND Projects to acquire and sustain combat aircraft, armoured vehicles and warships.



Denis Bertrand completed over 36 years of service with the Department of National Defence (DND), and served as a Senior System Engineering (SE) policy advisor for the Material Group in the DND, and System engineer manager on several major crown projects for DND.

His formal education includes a Baccalaureate Degree in Electrical Engineering from the Royal Military College in Kingston, a Masters degree in Aeronautical Engineering, and a Degree of Aeronautical and Astronautical Engineer from the Naval Postgraduate School in the United States of America.

He retired from the public service in May 2016, and is now a full-time contractor working on a DND contract.

14:30-15:30 Sustaining Alignment through Collaboration; a Relational Benefit

Speaker: Lieutenant-Commander Scott Koshman, CD, RMC, MSc, ASQ CRE, ASQ CMQ/OE (DND)

Abstract. Changing procurement practices in the Naval and Defence sector for materiel support are changing relationships between government and industry. These relationships, like materiel, need to be sustained through-life and adapted to ever changing contexts. Successful outcomes are best achieved through conscientious integration and shared intelligence.



Lieutenant-Commander **Scott Koshman**, CD, rmc, MSc, ASQ CRE, ASQ CMQ/OE:

- Works in Department of National Defence within the Materiel Group as the Deputy Program Manager for the Naval In-Service Support Program, a strategic transformation initiative with a focus on future fleets.
- Completed 20 years with the Royal Canadian Navy as a Naval Combat Systems Engineer, having sailed on HMCS Ottawa and HMCS Vancouver.
- Graduated Royal Military College Kingston in 2000 with a Baccalaureate in Honours Sciences. Attained a Masters of Science in Industrial and Systems Engineering, Quality and Reliability Engineering in 2011 from Rutgers, The State University of New Jersey.
- Led Naval Materiel policy and supportability process development. Received the Maritime Equipment Program Management Special Award for his work with the Naval Materiel Assurance Program.
- Engineering Change Project Manager for fire controls system upgrades on the Iroquois Class. Provided in-service engineering support to radars and electronic warfare systems.
- Led an electronic warfare test and evaluation team, including participation in NATO Trial Spartan Hammer.
- Is a keen advocate of quality, knowledge, and change management. Strong believer in the integration of supportability and reliability engineering as keep components for decision, risk, and business processes.

Workshop 3: System Security Engineering

Friday, Nov. 25, 8:30-10:00. Location: FSS 4006

Chair: Andy Oldershaw (NRC)

Speaker: Denis Gendron (INCOSE Canada)

Abstract. System Security Engineering (SSE) is a specialty from System Engineering (SE) providing a methodology for the development of secure systems.

Mr. Gendron will expose how the SSE specification NIST-SP-800-160 maps in the SE framework, and will discuss the various activities and skillsets expected at each phase.



Denis Gendron holds a Bachelor in Electrical Engineering from Sherbrooke University and a D.E.S.S. in Telecommunication Computer Sciences from Université du Québec en Outaouais. After practicing as a teacher in Computer Science, Telecoms and Industrial processes, he started his own venture designing computerized systems for the industry and disabled persons. This managerial experience brought him to director-level positions while seating at various Boards of Directors. Mr. Gendron is currently providing expertise to the Government of Canada in network engineering and cyber defense.

Workshop 4: Internet of Things Hands-on – Turn your mobile phone into an IoT device

Friday, Nov. 25, 10:30-15:30. Location: FSS 4006

Chair: Andy Oldershaw (NRC)

Speaker: Carlos Ramirez (IBM Canada)

Abstract. This workshop demonstrates the use of your Android™ mobile phone or tablet as an “internet of things” device, streaming real sensor data to a cloud-based application for analysis and display, and receiving commands in return. You will use an app on your phone that communicates with a cloud-based application that you will build using IBM Bluemix and the Watson IoT Platform service. The lab starts you off with Node-RED, but many other services are available for your experimentation.

IBM Watson IoT Platform is where you can set up and manage your connected devices, and is provided as a set of integrated Bluemix services. Bluemix is an environment to quickly create, deploy, and manage applications in the cloud. IBM Watson IoT Platform enables you to securely connect many types of devices from simple sensors to intelligent appliances and industrial components. With ease, you can develop and deploy your own custom enterprise-scale IoT solutions. The platform’s rich analytics and cloud-based connectivity provide you with the insights you need for market innovation and business transformation. In this hands-on workshop, your Android or iOS phone or tablet will be the IoT device. An app that is running on your device will publish its Accelerometer data (accel events), and this data will be received by another app that you build on the cloud using Bluemix. To show the ability for bidirectional communication with your connected IoT device, your cloud-resident app will respond to the device with commands (color commands) to change the background color of the IoT device’s screen. The morning session is as follows:

- Create an IoT App in Bluemix
- Add a device that will send MQTT messages to the IoT Platform
- Install and Configure the IoT Starter App
- Verify that messages are being sent from your mobile phone to the IoT Platform
- Register a device into the platform
- Visualize data using the Watson IoT Dashboard

The afternoon session will demonstrate how to connect a development kit (TI SensorTag with 11 sensors) to the Watson Internet of Things Platform. We will be using your smart phone device to connect to the BLE (Bluetooth Low Energy) device that will be serving as a gateway sending JSON formatted MQTT messages to the platform. As the data is being captured in real time, a set of rules will be established to create an action (email notification) if the sensor data exceeds a defined threshold.



With over 10 years at IBM and over 20 years in Information Technology, **Carlos Ramirez** is a Senior Technical Sales Specialist on Internet of Things Platform and Continuous Engineering for IBM and is part of the Solutions Architects team for North America. Before joining IBM, Carlos was a Software Architect and a Senior Developer. Currently, Carlos works closely with customers, providing technical and architectural guidance and recommendations to meet their needs. Carlos holds a Master’s in Science, Industrial Engineer, from the Instituto Tecnológico y de Estudios Superiores de Monterrey, Mexico.

Web: <https://www.linkedin.com/in/carlos-ramirez-36731540>

W5: Specialty Engineering Integration

Friday, Nov. 25, 8:30-15:30. Location: FSS 5028

Chair: Steve Gribbon (Croyben Aerospace Technology)

8:30-12:00 Human Factors Engineering

Speaker: Paul McKay (Esterline CMC Electronics)



Following his B.Sc. in Mechanical Engineering, **Paul McKay** obtained his M.A.Sc. degree in Systems Design Engineering from the University of Waterloo, where he specialized in advanced interface design and aviation human factors. He is currently Human Factors Engineer at Esterline CMC Electronics, with interests in human factors, human performance engineering, and complex systems.

Web: <https://www.linkedin.com/in/paul-mckay-ba319a1b>

13:30-15:30 E3 Safety, Reliability, Maintainability

Speakers: Lorne Callies, P.Eng. (E3 consultant), Tony Zenga, BSc. Eng. (CMTIGroup Inc.), and Susan Cox (The SafetyWright Inc.)

Abstract. Systems Engineering is built on the foundation of compatibility, requiring interfaces to comply with appropriate standards and systems able to tolerate their operating environment.

Electromagnetic Compatibility continues to be a fundamental consideration in system design. Technological advances have helped to resolve old EMC issues, while at the same time creating new ones.

Today, your watch can show your location using satellite signals; your cell phone can connect via Bluetooth to your watch and your car; your car can play music recorded on your phone, or telephone your contacts, or connect to your home network via the internet. All this happens using different portions of the RF Spectrum assigned to wireless communication standards (GPS, Cellular, Wide Area, Local Area and Personal Area wireless networks).

The complex example we will investigate is the introduction of Portable Electronic Devices and wireless networks in aircrafts. This represents a new and important risk to manage in a crowded Electromagnetic Spectrum.



Lorne Callies is an independent System Engineering Consultant specializing in Electromagnetic Effects and Compatibility. His specialization has developed over the past thirty years designing products and systems for the Defence industry, communications and security industries including verifying product performance and integrity. Located in Ottawa, he has worked as a senior Systems Engineer for more than a handful of Defence, Communications and Security Companies.

Regardless of the product, application or environment, Electromagnetic Compatibility and protection from interference has remained a fundamental requirement of system engineering, not to be taken lightly.

Presently, Mr. Callies is consulting to the Department of National Defence (DND) Technical Airworthiness Authority as a Sr. EMC Engineer.



Tony Zenga is a Systems/Specialty Engineering consultant with over 30 years of experience in development, analysis, and management of large scale Safety Critical systems in: Aerospace, Space Systems (ISS and various Satellite programs), Air Traffic Control Systems (ATC), Mass Transit, Transportation and Defense programs. He has expertise in hardware and software Mission Assurance, System/Software Safety, Reliability and System life cycle development & analysis.

As an independent Systems Assurance Consultant and on behalf of his customers, Tony developed several System Safety analyses. The Safety analysis and reports were essential for the successful certification and revenue service of respective systems.



Susan Cox is president of The SafetyWright Inc., offering independent system safety consulting services for rail transit. Her 25+ years of professional experience spans system safety, system design, business development, software development and control system design. Susan specialises in communications-based train control and real-time systems.

Susan has a B.A.Sc. and a B.Math. from the University of Waterloo, and is a member of Professional Engineers Ontario.

Web: <https://ca.linkedin.com/in/sue-cox-35b45a1>

Welcome and Opening Address

Saturday, Nov. 26, 9:00-9:30. Location: FSS 2005

Master of Ceremony: Maria-Anca Grigoriu (DND)

Speaker: Denis Bertrand (President, INCOSE Canada)

Abstract. In his opening address, Denis Bertrand will share his vision, mission, and status of the INCOSE Canada Chapter, as well as give an overview of his proposed strategic plan for the future.

Keynote Address: Protecting your Organisation and Assets against Corporate Espionage

Saturday, Nov. 26, 9:30-10:30. Location: FSS 2005

Chair: Steve Gribbon (Croyben Aerospace Technology)

Keynote speaker: Michel Juneau-Katsuya, President and CEO, The Northgate Group Corp

Abstract. The proliferation of cyber-based threats and other forms of corporate espionage increases continually, sponsored by state, criminal, corporate, and ideologically driven entities. The presentation will address the motivations behind these threats, ways and means the agents infiltrate organisations. The presentation will explain how organisations can work to identify, negate, or mitigate the effects of intrusions by introducing structures, measures and networks that more closely reflect the scope and motivations behind the attacks towards their specific situation. Examples from recent and significant successful attacks will be included to illustrate how effective these means are, and how widespread the practice has become.



With over 38 years of experience, **Michel Juneau-Katsuya** is internationally recognized as one of Canada's foremost experts in international and national security and intelligence, and economic and industrial espionage. He began his career with the Royal Canadian Mounted Police (RCMP) before transferring to the Canadian Security and Intelligence Service (CSIS). He has performed duties as Criminal Investigator, Intelligence Officer in both Counter Intelligence and Counter Terrorism. He has held several senior positions, including Chief of the Strategic Analysis Unit, Asia/Pacific. That unit focused on issues of economic and industrial espionage against Canada, and the ramifications for Canadian society and its economy and acquired internationally expertise in that field.

Now in the private sector, Michel performs Threat and Risk Assessments and security audits across all continents and is in great demand. He received a BA in International Relations from UQAM (Canada), and an MA in Social and Political Thought from the University of Sussex (England). He is a guest professor at University of Ottawa in Criminology. Michel is the co-author of the books: "[Nest of Spies: The Startling Truth About Foreign Agents at Work Within Canada's Borders](#)" published by Harper-Collins in 2009 and "[Ces espions venus d'ailleurs](#)" published by Stanké in 2009. Michel is currently working on two new books on espionage activities. Michel is also the author and host of a new TV series on the HISTORIA channel, to be presented in April 2017, on spy cases that have taken place in Canada since the Second World War.

Keynote Address: In-Service Support for the Royal Canadian Navy – The Next Steps

Saturday, Nov. 26, 10:00-11:00. Location: FSS 2005

Chair: Maria-Anca Grigoriu (DND)

Keynote speaker: **Commodore Simon Page, OMM, CD**

Director General, Maritime Equipment Program Management (DND)



Commodore Page enrolled in the Canadian Armed Forces in 1984 as a Maritime Engineer and graduated from the Royal Military College in 1989 with a Bachelor in Computer Engineering.

He achieved his Head of Department qualification onboard HMCS *Nipigon* in July 1992 and then commenced a four-year tour at the Canadian Forces Naval Engineering School. In 1996, he joined HMCS *Athabaskan* as the Combat Systems Engineering Officer and participated in his second STANAVFORLANT deployment. Commodore Page then worked as the Division Commander for the Officer Training Division of the Naval Engineering School and the Combat Systems Engineering Officer of Sea Training Atlantic.

In 2004, Commodore Page moved to the Chief of the Maritime Staff organization in Ottawa as a *Halifax*-Class Modernization Project Director. One year later, he completed the Command and Staff Course and a Master in Defence Studies at the Canadian Forces College in Toronto.

After two years in the Directorate General Maritime Equipment Program Management as Section Head for Materiel Acquisition and Support, in June 2008, he was appointed Commandant of the Canadian Forces Naval Engineering School in Halifax. On completion of this Command tour, he returned to Toronto and completed the National Security Program at the Canadian Forces College. Upon graduation in June 2011, he assumed the duties and responsibilities of the Director Maritime Training and Education. In December 2012, Commodore Page became the Chief of Staff for the Maritime Equipment Programme Management Division of the Materiel Group. On 23 June 2015, he was promoted to his current rank and was appointed as Director General Maritime Equipment Program Management.

Technical Session 1: Internet of Things (IoT) and Model-Bases Systems Engineering (MBSE)

Saturday, Nov. 26, 13:30-17:00. Location: FSS 2005

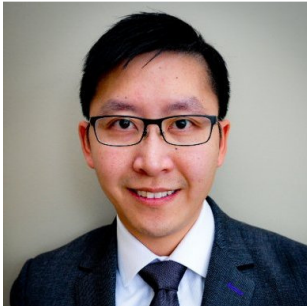
Chair: Mike Meakin (Thales)

13:30-14:15 IoT Trends and Developments in the Canadian Market

Speaker: Ambrose Chiu, MBA (IBM Canada)

Abstract. Internet of Things (IoT) is new buzzword in the technology space but it is not a new concept. So why the hype? What new technologies are helping to drive the potential of IoT? As a systems engineer, what does IoT mean to me? What are some opportunities I can take advantage of in this new connected world?

In this session, find out what are the driving forces enabling the IoT evolution, the current industry and market trends in Canada, examples of IoT use cases, and what IoT means to the systems engineering community.



Ambrose Chiu, IoT Leader at IBM Watson IoT, joined IBM in 2008 as a sales engineer with focus in engineering solution. Ambrose Chiu is currently the IoT leader responsible for developing the IoT business in Canada for IBM. Ambrose works with companies in Canada to help them understand the potentials of IoT, define new business models and technologies using IoT, and to create industry partnerships with IBM to create IoT products and services using the IBM Watson IoT platform.

Web: <https://www.linkedin.com/in/ambrose-chiu-mba-2b14674>

14:15-15:00 Connected Electric Vehicles in Smart Cities

Speaker: Hussein T. Mouftah, CRC and Distinguish University Professor, University of Ottawa

Abstract. The transformation of our current cities into smarter cities will bring challenges in diverse areas such as the transportation system, the electricity system, and wearable systems, just to name a few. In smart cities, Information and Communication Technologies (ICT) will play a vital role for providing services in the urban environment. These services include real time monitoring and reaction in time through wireless sensor and actuator networks. Smart Grids (SGs), Intelligent Transportation Systems (ITS), Internet of Things (IoT), Electric Vehicles (EVs), and Wireless Sensor Networks (WSNs) will be the building blocks of futuristic smart cities. Smart grid refers to the modernization of traditional power grid by incorporating two-way digital communication support at generation, transmission, and distribution level. Intelligent transportation system refers to making the vehicular traffic smarter by reducing congestion, optimized fuel consumption, shorter routes, and better safety, self-driving cars by using communication and sensing technologies. Internet of things refer to a world-wide network of interconnected objects uniquely addressable, employing M2M communications, based on standard communication protocols and allows people and things to be connected Anytime, Anyplace, with Anything and Anyone, ideally using Any path/network and Any service. IoT can be very useful for resource management in the context of smart cities. Wireless sensor networks are composed of sensor nodes capable of performing sensing and implementing the M2M communications. All these technologies will help to build a smart city. In this presentation, we will address technology trends with a focus on connected electric vehicles in smart cities.



Hussein T. Mouftah is an internationally-acclaimed scholar who has made significant contributions to the understanding and knowledge of telecommunication networks, particularly in regard to high-speed networks, optical networks, network switching architectures, and wireless cellular as well as ad hoc and sensor networks, among other technical areas related to the next-generation Internet – the so-called Internet-of-Things. He received the BSc in Electrical Engineering and MSc in Computer Science from the University of Alexandria, Egypt, in 1969 and 1972, respectively, and the PhD in Electrical Engineering from Laval University, Canada, in 1975. He joined the School of Electrical Engineering and Computer Science (was School of Information Technology and Engineering) of the University of Ottawa in 2002 as a Tier 1 Canada Research Chair Professor, where he became a *University Distinguished Professor* in 2006. He has been with the ECE Dept. at Queen's University (1979-2002), where he was prior to his departure a Full Professor and the Department Associate Head.

He has six years of industrial experience mainly at Bell Northern Research of Ottawa (Nortel Networks). He served as Editor-in-Chief of the IEEE Communications Magazine (1995-97) and IEEE ComSoc Director of Magazines (1998-99), Chair of the Awards Committee (2002-03), Director of Education (2006-07), and Member of the Board of Governors (1997-99 and 2006-07). He has been a Distinguished Speaker of the IEEE Communications Society (2000-2007). He is the author or coauthor of 11 books, 73 book chapters and more than 1500 technical papers, 14 patents, 6 invention disclosures and 145 industrial reports. He is the joint holder of 22 Best/Outstanding Paper Awards. He has received numerous prestigious awards, such as the 2016 R.A. Fessenden Medal in Telecommunications Engineering of IEEE Canada, the 2015 IEEE Ottawa Section Outstanding Educator Award, the 2014 Engineering Institute of Canada K. Y. Lo Medal, the 2014 Technical Achievement Award of the IEEE Communications Society Technical Committee on Wireless Ad Hoc and Sensor Networks, the 2007 Royal Society of Canada Thomas W. Eadie Medal, the 2007–2008 University of Ottawa Award for Excellence in Research, the 2008 ORION Leadership Award of Merit, the 2006 IEEE Canada McNaughton Gold Medal, the 2006 EIC Julian Smith Medal, the 2004 IEEE ComSoc Edwin Howard Armstrong Achievement Award, the 2004 George S. Glinski Award for Excellence in Research of the University of Ottawa Faculty of Engineering, the 1989 Engineering Medal for Research and Development of the Association of Professional Engineers of Ontario, and the Ontario Distinguished Researcher Award of the Ontario Innovation Trust. Dr. Mouftah is a Fellow of the IEEE (1990), the Canadian Academy of Engineering (2003), the Engineering Institute of Canada (2005) and the Royal Society of Canada RSC Academy of Science (2008).

15:30-16:15 Industrial Use of Model-Based Engineering: Lessons Learned and Future Directions

Speaker: Francis Bordeleau (Ericsson)

Abstract. In this presentation, we will first discuss the experience of Ericsson using Model-Based Engineering (MBE) over the last 20 years. We will then discuss aspects that we consider fundamental for the establishment of MBE as a key component of development processes and why MBE is essential for achieving the required level of development and business agility. In particular, we will focus on the need for organizations to collaborate on the establishment of a common open source MBE platform to foster innovations and facilitate technology transfer. We will also discuss the main challenges associated with the development and management of such open source solution.



Francis Bordeleau is Product Manager in the Software Development group at Ericsson. His main areas of responsibilities include model-based engineering and modeling tools. In this role, he is responsible for defining product specification and roadmap, developing business cases, managing budget, managing open source initiatives, and collaborating with other end-user organizations, suppliers, and research/academia. He is also the Chairman of the [Eclipse Papyrus Industry Consortium \(IC\)](#). Francis holds a Ph.D. in Computer Science from Carleton University.

16:15-17:00 Open Source System Engineering and Development

Speaker: Charles Rivet (Zeligsoft)

Abstract. This presentation will talk about Open source alternatives to commercial MBSE offerings as governed by a recently created open source organisation, the Papyrus Industry Consortium (Papyrus IC). It will provide an overview of the Papyrus IC and how it is contributing to open source modeling, focusing on two MBSE tools: Papyrus for System Engineering (Papyrus-SE) and Papyrus for Real Time ([Papyrus-RT](#)).



Charles Rivet has close to 30 years of experience in software and systems development and management. Since 1998, Charles has worked in various position to support, develop, manage, govern, and market software and systems development and testing tools and solutions at ObjecTime (ObjecTime Developer), Rational (Rose RealTime), IBM (RSA, RSA-RTE, Tau, SDL/TTCN Suites, and System Tester), and Zeligsoft (Papyrus-RT).

Full details at <https://ca.linkedin.com/in/charlesrivet>.

Technical Session 2: System Security Engineering (SSE)

Saturday, Nov. 26, 13:30-17:00. Location: FSS 1030

Chair: Ray Barton (Vitesse Re-Skilling Canada)

13:30-14:15 Strategies for Surviving the Security Arms Race

Speaker: Prof. Anil Somayaji (Carleton Computer Security Lab, Carleton University)



Anil Somayaji is an Associate Professor in the School of Computer Science at Carleton University in Ottawa, and is Associate Director of the Carleton Computer Security Lab (CCSL). He received a B.S. (1994) in Mathematics from the Massachusetts Institute of Technology and a Ph.D. (2002) in Computer Science from the University of New Mexico. He has served as the program committee chair of the New Security Paradigms Workshop and has served on the program committees of major computer security venues including ACM CCS, USENIX Security, ACSAC, and RAID, among others. His research interests include computer security, operating systems, complex adaptive systems, and artificial life.

14:15-15:00 PEO's Role in the Challenge of Emerging Engineering Disciplines – Specifically, Cyber Security Engineering / Communications Infrastructure Engineering

Speaker: Peter M. DeVita, MASC, MBA, P.Eng., FEC (DeVita Associates, and PEO EDTF)

Abstract. Cyber Security Engineering has become a major example of the issues with new engineering disciplines. PEO officially recognized this area of practice in 2010 after two years of work in defining its core body of knowledge. Unlike other Licensed professions, the scope of engineering practices expands with new science and technology. Cyber Security has become a clear example of how the 'public interest' is significantly impacted by this area of practice. The presentation will explore these issues and what PEO is doing to fulfill its mandate to 'govern the practice of engineering'... 'in order that the public interest is served and protected'.

Topics:

1. PEO's mandate & The meaning of a licence to practice
2. Protecting the public interest, a universal challenge
3. Licensing engineering practice – unique challenges vs other professions
4. The emerging disciplines – the ones declared
5. CIE (alias Cyber Security Engineering) – the public interest impact
6. Canadian self regulation & peer review
7. Progress made towards establishing this new restricted practice



Peter M. DeVita has both B.A.Sc. and M.A.Sc. degrees in engineering from the University of Toronto in computer and environmental studies, and an MBA from York University. DeVita served on the board of the Canadian Society of Professional Engineers (CSPE) for 10 years, and was the Society president from 1984-1986. He was a Lieutenant-Governor Appointed Councilor from 1991-97. He served as President of the PEO in 2000-01, preceded by terms as VP and President-elect. He has served on the National Board of Engineers Canada (previously the Canadian Council of Professional Engineers) and was on its Executive Committee in 2001. He helped the founding of the Ontario Society of Professional Engineers (OSPE) and served from 2004-07 on its Board of Directors.

In recognition of his Extraordinary Service to the Profession, Peter M. DeVita was invested as a Companion in Professional Engineers Ontario's *Order of Honour* in April 2003. Peter was also nationally recognized as a Fellow of Engineers Canada (FEC) for his contributions to the Profession.

He has chaired and served on many of the profession's committees with lasting work on Emerging Disciplines for over two decades. DeVita has enjoyed a career in high technology electronics, computers and software. He is President of DeVita Associates. Since the introduction of the Green Energy Act in 2009, DeVita has more recently returned to his environmental interests as a consultant in sustainable green energy with a focus on energy uses assessments by places of worship. DeVita is an adjunct professor at Sheridan College where he teaches Engineering Economics, Energy management and an undergraduate course on the Impact of Culture on the Canadian Workplace. He is also the author of "[A Search for Advocacy – Creating the Canadian Engineering Profession](#)".

15:30-17:00 Systems Security Engineering – Providing Mission Assurance to DND

Speakers: LCdr Marc Lanouette (DND) and Steve Sterling (DND)

Abstract. Systems Security Engineering within ADM(Mat) deals with the security required of a system throughout its life-cycle in order to provide Mission Assurance. This presentation will highlight the need for SSE in ADM(Mat), how we are creating the discipline and where we are to date. It will also discuss the requirement and challenges of conducting risk assessments on military platforms based on various security risk management frameworks, standards and guidance including ISO 27000 series, NIST 800-53, NIST Cybersecurity Framework, ITSG-33 and RTCA/DO-326A/355/356.



Stephen Sterling started his career in 1989 with the RCAF as an Aerospace Engineer. He has a Bachelor and Masters of Engineering (Electrical) from Royal Military College of Canada and Carleton University, respectively. Upon being qualified as an Aerospace Engineer, Stephen worked as a maintenance engineer in Search and Rescue followed by several aircraft specialist engineering roles, including Electronic Warfare, Communications, Electromagnetic Environmental Effects and, for the past six years, Systems Security Engineering. Stephen is currently the Team Leader for Air Warfare – Systems Security Engineering.



LCdr Marc Lanouette joined the Royal Canadian Navy in 1997 and graduated from the Royal Military College of Canada in 2001 with a Bachelors of Engineering in Computer Engineering. He completed 3 tours at sea as a Naval Combat Systems Engineering Officer, most recently as the head of the Combat Systems Engineering department onboard HMCS REGINA. His shore postings include two years in recruiting, two and a half years in Above Water Warfare Analysis and as Executive Assistant to the Director General, Maritime Equipment Program Management. LCdr Lanouette is a recent graduate from the Canadian Forces College with a Masters of Defence Studies and he holds a Masters of Applied Sciences in Electrical and Computer Engineering. He has been devoted to establishing a Systems Security Engineering program within DGMEPM since 2013 and is currently the acting Section Head of the Directorate of Naval Combat Systems – Systems Security Engineering section.

Technical Session 3: Systems Requirements and Processes

Saturday, Nov. 26, 13:30-17:00. Location: FSS 1007

Chair: Daniel Amyot (University of Ottawa)

13:30-14:15 Developing and implementing systems engineering and project management processes at CSiT - A small Canadian company in public transportation

Speakers: Claude Y. Laporte (École de technologies supérieure) and Denis Poliquin (CSinTrans Inc.)

Abstract. A project was created to define and implement project management and systems engineering processes at CSinTrans Inc. (CSiT), a Canadian company, founded in 2011. CSiT specializes in the integration of communication and security systems in transit industry such as trains, subways and buses as well as railway stations, subway stations and bus stops. ISO/IEC 29110 standard and guides for systems engineering have been used as the main reference for the development of these processes.

The project's history, purpose and rationale that prompted CSiT to adopt this recently published standard are presented. The implementation of the standard is described. The reflections and decisions made during the implementation are presented. The lessons learned are discussed. Recommendations and advice for organizations wanting to implement ISO/IEC 29110 are described.

ISO 29110 has helped raise the maturity of the organization by implementing proven practices and developing consistent work products from one project to another. ISO/IEC 29110 was a good starting point to align processes with specific practices of CMMI® Maturity Levels 2 and 3. ISO/IEC 29110 has also helped CSiT with developing light processes as well as remaining flexible and quick in its ability to respond to its customers.

In 2016, the systems engineering Basic Profile of the ISO 29110 has been successfully audited by a third-party audit team composed of 2 independent auditors, one of whom was a systems engineering domain expert.



Dr. Claude Y. Laporte has been a professor since 2000 at the École de technologie supérieure, a 11,000-student engineering school. He has worked in defense and transportation organizations for over 20 years. He is the Project Editor of ISO/IEC 29110 standards for Very Small Entities. He is the co-author of two French books on software quality assurance published by Hermes Science-Lavoisier and one English textbook, on the same topic, to be published by John Wiley and Sons in 2017.

E-mail address: claporte@etsmtl.ca

Web site: <http://profs.etsmtl.ca/claporte/English/index.html>



Denis Poliquin is president at CSiT, a Montreal company specializing in system integration and software design for Communications and Security systems in transit industry. His experience includes responsibilities related to systems engineering, marketing, management of marketing, marketing on a global scale as well as general management. He spent over 25 years in the information technology industry focused on large system integration projects. He has been a member of Professional Engineers Ontario for over 20 years.

e-mail address: denis.poliquin@csintrans.com

Web site address: <http://www.csit.co>

14:15-15:00 Evaluating Evolving Requirements Models with URN: Features, Goals, & Scenarios

Speaker: Prof. Gunter Mussbacher (McGill University)

Abstract. The [User Requirements Notation](#) (URN) is a requirements engineering (RE) standard published by the International Telecommunication Union. URN combines goal-oriented modeling with scenario-based modeling, supporting key RE activities from elicitation to specification and analysis. Goal models are used to capture stakeholder objectives and desired system qualities, and then to evaluate potential solutions to achieve these objectives/qualities. Scenario models describe potential solutions in greater detail, while indicators enable the use of real-life measures to quantitatively characterize the solutions.

Recent extensions transform URN into a holistic reasoning framework that (i) extends to features and Software Product Lines and (ii) allows changes to a system over time to be modeled and analyzed. These powerful mechanisms enable advanced and yet concise modeling of socio-technical systems that need to continuously evolve: based on the evaluation of stakeholder objectives over time with goal models, the most appropriate feature configuration is determined, hence adapting system behavior expressed with scenario models to the current context.



Gunter Mussbacher is an Assistant Professor at the Department of Electrical and Computer Engineering of McGill University. He has 100+ publications related to model-driven requirements engineering, modularity in modeling, reuse, and sustainability. Gunter is one of a handful of URN experts and has been the associate rapporteur at the International Telecommunication Union (ITU-T) for URN since 2013. Gunter is a frequent program committee member and conference/workshop organizer and has given many invited tutorials/talks on URN at international conferences, in academia, and in government. He holds a Ph.D. degree in Computer Science from the University of Ottawa.

Web: <http://www.ece.mcgill.ca/~gmussb1/>

15:30-16:15 A Standards Based Reference Model Approach for Systems Engineering for Software Intensive Systems

Speaker: Mark Jennings CD2, BEng (DLCSPM 8-5, DND)

Abstract: The presenter will discuss a standards-based reference model approach to systems engineering for software Intensive systems. This approach is based on International and North American system, software, and quality standards, with a focus on determining the essential key artifacts, templates, methods, training, and tools to enable the development of product, data, and end-user quality.



Mark Jennings is a System Engineer currently overseeing the operations and maintenance of a Software Engineering Facility within the Directorate of Land Command Systems Program Management within the Materiel Group supporting the Land Command Support System, Canada's C4ISR Tactical network. He is the Technical Cooperation Program (TTCP) Canadian National Leader on System Security Engineering within the Department of National Defence Canada, and has been an active supporter of TTCP Systems Engineering Panel. He has been advising the Materiel Group defence acquisition programs on system security engineering since 2011 and on software assurance since 2008.

Mark is a graduate from the Royal Military College of Canada Class of 85 in Electrical Engineering. He is a retired Army Officer of 30 years with over 25 years Systems / Software Engineering experience and over 7 years System Security Engineering experience within the Canadian Forces and Department of National Defence. His 35-year career with Defence has spanned: intelligence surveillance and target acquisition and reconnaissance systems; space surveillance systems; tactical armoured vehicles systems; soldier systems; tactical simulation systems; and air defence and tank systems. He has been a Departmental reviewer of the draft ISO 15288:201x and 12207:201x System and Software Life Cycle Standards and is an active member of the Materiel Group Life Cycle Management Systems Engineering Sub Group.

16:15-17:00 Requirements Life Cycle Approach, and Presentation & Quality of Requirements

Speaker: Denis Bertrand CD, P. Eng, Msc, Ae.Eng (consultant)

Requirements must be defined considering the entire life cycle of your system/product or service (from “cradle to grave”). The Requirements Life Cycle Approach provides the various viewpoints seen by the users/clients, project/system engineering staff, and in-service personnel.

As well, the presentation and quality of stakeholders and systems requirements are key for the successful acquisition, production, and in-service support/sustainment of systems, and affiliated enabling systems. There are several characteristics of both requirements and sets of requirements that are used to aid their development and to verify the implementation of requirements into the system solution.



Denis Bertrand completed over 36 years of service with the Department of National Defence (DND) (*23 years in uniform, and 12 as public servant*), and served as a:

- Senior System Engineering (SE) policy advisor for the Materiel Group in the DND with regards to SE policy, standards, business processes/ procedures, guidance, tools, and training/knowledge transfer/competencies.
- System engineer manager on several major crown projects for the Army, and served on a three-year tour with 1 (UK) Armored Division in Germany, as the lead Electronic/ optronic/missile systems expert supporting numerous key warfighting equipment.

Denis obtained a Baccalaureate Degree in Electrical Engineering from the Royal Military College in Kingston, a Masters degree in Aeronautical Engineering, and a Degree of Aeronautical and Astronautical Engineer from the Naval Postgraduate School in the United States of America.

Takeaways, Prizes, and Closing Remarks

Saturday, Nov. 26, 17:00-17:30. Location: FSS 2005

Master of Ceremony: Maria-Anca Grigoriu (DND)

Speaker: Denis Bertrand (President, INCOSE Canada), Charles Rivet (Papyrus IC), and Session Chairs

Cocktail Reception at Café Nostalgica

Saturday, Nov. 26, 17:45-20:00. Location: [Café Nostalgica](#), 603 Cumberland

Come for one last (relaxing) networking opportunity! One free drink per participant, and free finger food!



Additional Information

Registration Desk – Sponsored by **THALES**

The conference registration desk is open at the main conference venue on the 1st floor of the Faculty of Science (FSS) building. Phone: 613-808-9369

- Friday 7:45 – 15:30
- Saturday 8:00 – 16:00

Participation identification

The conference enforces a strict badge policy. Badges shall be worn at all times during the conference.

Internet Access

Use the SSID named *guOttawa*. There is no need for login or password and there is no security or encryption on the wireless. Note that EDUROAM is also available at the University of Ottawa.

Public Transports and Tickets

The main public transport company is OC Transpo (<http://www.octranspo.com>). Tickets are available at the Campus Pharmacy and at the Pivik Convenience store (main floor, University Centre – UCU).

Pharmacies

The Campus Pharmacy is located at 100 Marie Curie Private, 613-563-4000.

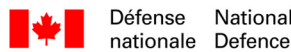
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- Campus Protection Emergency: 613-562-5411
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With Thanks

First and foremost, our thanks go to all of our **speakers** for their time and consideration and for making this event such a worthwhile endeavour!

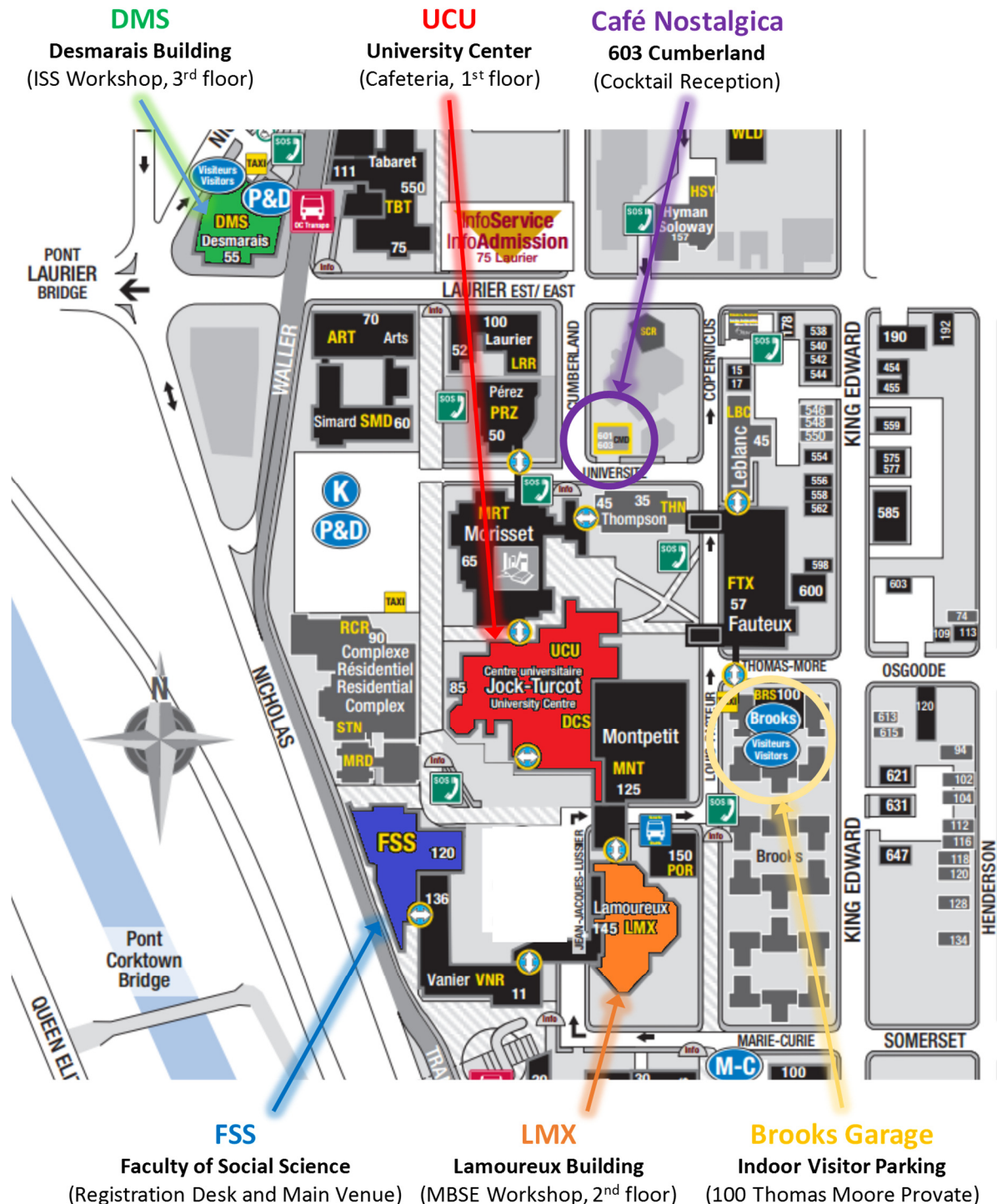
Warm thanks to the many **student volunteers** (led by **Madeleine Bertrand**) for the multiple hours they have freely invested in making this event run smoothly.

In addition, we also owe special thanks to:

- **Fiby Labib**, Conventions and Reservations (uOttawa) for her much-appreciated help with the many reservations (and modification thereof) and with the event logistics.
- **Dr. Ioan Nistor**, Interim Dean of the Faculty of Engineering, for his strong support for this event.
- **Dr. Marcel Merette** (Dean), **JoAnne St-Gelais**, **Nathalie Saumure**, **Marie-Anne Burgess**, and others from the Faculty of Social Science, for welcoming us to their building.
- **Isabelle Mayrand** and **Arianne Gagné**, from the Registrar's Office, for generously hunting classrooms for us.
- **Suzanne St-Michel**, from the School of Electrical Engineering and Computer Science, for providing material and other goodies for the volunteers.

Finally, thanks to **you**, active participants, for believing in this event! Come back next year, and bring your friends and colleagues!

Venue



- Visitor parking is available in the Brooks Garage, 100 Thomas Moore Private.
- Parking on campus is expensive (\$16/day). Participants are encouraged to [use the bus](#).
- See <https://www.uottawa.ca/parking/parking-services/visitors-daily-parking-rates> for other parkings.
- Distances from FSS: DMS (7 min), UCU (2 min) LMX (3 min), Nostalgica (5 min), Brooks Garage (5 min)