AGENDA

OPAL-RT’s 9th International Conference on Real-Time Simulation

September 5 – 8, 2017

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EGSTON

WWW.OPAL-RT.COM/RT17
Floor plans

9th floor

11th floor
# Agenda

## Tuesday, September 5th

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<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tr>
<td>7:30 AM - 8:30 AM</td>
<td><strong>Registration &amp; Breakfast</strong></td>
<td><strong>Beaver Hall</strong></td>
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<td></td>
<td>Breakfast sponsored by <strong>ABB</strong></td>
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<tr>
<td>8:30 AM - 10:15 AM</td>
<td><strong>Trainings</strong></td>
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<td></td>
<td>Training: Bringing Your Model Into Real Time</td>
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<td></td>
<td>Training: The Behind-The-Scenes of Inter-FPGA Communication Using High Speed Serial Links</td>
<td><strong>Viger</strong></td>
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<td>Training: Using HYPERSIM Advanced Features - Part I</td>
<td><strong>Palais</strong></td>
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<td>10:15 AM - 10:35 AM</td>
<td><strong>Break</strong></td>
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<td>10:35 AM - 12:00 PM</td>
<td><strong>Trainings</strong></td>
<td><strong>Beaver Hall</strong></td>
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<tr>
<td></td>
<td>Training: Achieving Test Automation With eMEGASIM</td>
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<td>Training: How to Use State Space Nodal Efficiently</td>
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<td></td>
<td>Training: Using HYPERSIM Advanced Features - Part II</td>
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<tr>
<td>12:00 PM - 1:00 PM</td>
<td><strong>Lunch</strong> Sponsored by <strong>ABB</strong></td>
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<td>1:00 PM - 2:45 PM</td>
<td><strong>Trainings</strong></td>
<td><strong>Beaver Hall</strong></td>
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<td>Training: Large Grid Model Import Made Easy</td>
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<td>Training: A New Way of Interacting with Your RT-LAB Model</td>
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<td>Training: Power System Protection, Control and Monitoring Applications - Part I</td>
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<td>2:45 PM - 3:05 PM</td>
<td><strong>Break</strong></td>
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<td>3:05 PM - 4:30 PM</td>
<td><strong>Trainings</strong></td>
<td><strong>Beaver Hall</strong></td>
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<td>Training: ePHASORSIM: User Defined Modeling</td>
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<td>Training: Integrating your Controller with our Multi-Level Modular Converter (MMC)</td>
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<tr>
<td></td>
<td>Training: Power System Protection, Control and Monitoring Applications - Part II</td>
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<td>4:00 PM - 6:00 PM</td>
<td><strong>Registration</strong></td>
<td><strong>Beaver Hall</strong></td>
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<tr>
<td>6:00 PM - 10:00 PM</td>
<td><strong>Welcome Cocktail</strong></td>
<td><strong>Beaver Hall</strong></td>
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<td>Evening sponsored by <strong>TRIPHASE</strong></td>
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*Business casual attire proposed*
WEDNESDAY, SEPTEMBER 6th

REGISTRATION & BREAKFAST  ROOM MONTREAL C-D
7:30 AM - 8:30 AM  —  Breakfast  Sponsored by  National Instruments

PRESENTATIONS  ROOM: MONTREAL A-B
8:30 AM - 9:15 AM  —  Welcome to RT17! A New Era of Real-Time Simulation at OPaL-RT TECHNOLOGIES
9:15 AM - 10:40 AM  —  Power Systems Keynote
by Étienne Leduc, OPaL-RT
INCLUDING SPECIAL PRESENTATIONS:
The Role of Microgrids in Grid Modernization Initiatives by Sima Seidi, TetraTech, Canada
10:40 AM - 11:10 AM  —  BREAK  Sponsored by Intel
11:10 AM - 12:00 PM  —  Digital Transformation - Disrupt or Be Disrupted!
by Denis Gaudreault, INTEL, Canada
12:00 PM - 1:00 PM  —  LUNCH  Sponsored by triphase

TECHNICAL PRESENTATIONS  ROOM: VILLE MARIE  ROOM: ST-ANTOINE  ROOM: MONTREAL A-B
1:00 PM - 1:30 PM  —  HQ Experiences in Case of Using Control System Replica Interfaced With HYPERsIm Real-Time Simulator in Recent HVDC Upgrade Projects by Alpha Oumar Barry, IREQ, Canada
1:30 PM - 2:00 PM  —  HIL-Grid Model on OPaL-RT for Testing Future Grid Control Centers by Eric Glende, OVGU University Magdeburg, Germany
2:00 PM - 2:30 PM  —  The Use of Real-Time Simulation to De-risk and Manage HVDC and FACTS Schemes - Experiences on the French Transmission Grid by César Martin, RTE, France
2:30 PM - 3:00 PM  —  New Travelling Wave Fault Location at SEL and the Need for Advanced HIL Solutions, by Armando Guzman, SEL inc., Canada
3:00 PM - 3:30 PM  —  BREAK  Sponsored by AMETEK
3:30 PM - 4:00 PM  —  Assessment of the Mexican Interconnected Electric Power System Operation considering Non-Conventional Renewable Energies by Dr. Arturo R. Messina, Mexico
4:00 PM - 4:30 PM  —  AC Power Systems for Grid Simulation, by Mahesh Thaker, Ametek Programmable Power, USA
4:30 PM - 5:00 PM  —  Design and Implementation of a Modular Multilevel Converter Supported by HIL Simulation by Frédéric Colas, L2EP Ensam, France

COCKTAIL AND DINNER  ROOM: FORTIFICATION
6:00 PM - 7:00 PM  —  RECEPTION COCKTAIL
7:00 PM - 10:00 PM  —  GALA DINNER*  *FORMAL ATTIRE PROPOSED

Evening  sponsored by National Instruments
THURSDAY, SEPTEMBER 7th

**BREAKFAST**

ROOM: MONTREAL C-D

7:30 AM - 8:30 AM  --- Breakfast Sponsored by Hydro Québec

**PRESENTATIONS**

ROOM: MONTREAL A-B

8:30 AM - 8:40 AM  --- Welcome!

8:40 AM - 9:40 AM  --- Power Electronics and Power-Hardware-in-the-Loop Keynote by Christophe Brayet, OPAL-RT

9:40 AM - 10:10 AM  --- Innovating in a IoT, IoP World by Greg Farthing, ABB, Canada

10:10 AM - 10:40 AM  --- BREAK Sponsored by etap

10:40 AM - 11:20 AM  --- Automotive Keynote by Herve Pollart, OPAL-RT

11:20 AM - 12:00 PM  --- Aerospace & Defense Keynote by Alexandre Leboeuf, OPAL-RT

12:00 PM - 1:00 PM  --- LUNCH Sponsored by National Instruments

**TECHNICAL PRESENTATIONS**

ROOM: VILLE MARIE

1:00 PM - 1:30 PM  --- Vehicle-Grid Integration HIL for Designing Advanced Ancillary Services for Power Systems by Yutaka Ota, Tokyo City University, Japan

1:30 PM - 2:00 PM  --- Power-HIL and the KIT Energy Smart Home Lab Environment by Sebastian Hubschneider, Karlsruhe Institute of Technology, Germany

2:00 PM - 2:30 PM  --- Microgrid Testbeds & Controller Procurement, by Przemyslaw Koralewicz, NREL, USA

2:30 PM - 3:00 PM  --- A Power-Hardware-in-the-Loop Test Bench for Electric Machine Emulation by Amit Kumar K. S., Concordia University, Canada

3:00 PM - 3:30 PM  --- BREAK Sponsored by gentec

3:30 PM - 4:00 PM  --- Status of Energy Lab 2.0 and Overview of PHIL Activities by Jörn Geisbüsch, Karlsruhe Institute of Technology, Germany

3:30 PM - 4:00 PM  --- Testbed for Power System Stabilizer Tuning Using Synchrophasor Measurements and eMEGaSim by Jaime Cristóbal Cepeda, CENACE, Ecuador

3:30 PM - 4:00 PM  --- A Novel Parallel Robot for Fast Pick-and-Place Operations by Peyman Karimi Eskandary, McGill University, Canada

4:00 PM - 4:30 PM  --- The Importance of Electrical Fault Insertion in HILS Applications by Brennan Caissie, Pickering, USA

4:00 PM - 4:30 PM  --- Real-Time Application of Proprioseptive Tactile Sensing With Robotic Graspers by Bruno Belzile, McGill University, Canada

**TRACK 1 - POWER-HARDWARE-IN-THE-LOOP**

**TRACK 2 - AERO, AUTO, MARINE & AUTOMATION**

3:30 PM - 4:00 PM  --- Testbed for Power System Stabilizer Tuning Using Synchrophasor Measurements and eMEGaSim by Jaime Cristóbal Cepeda, CENACE, Ecuador

3:30 PM - 4:00 PM  --- A Novel Parallel Robot for Fast Pick-and-Place Operations by Peyman Karimi Eskandary, McGill University, Canada

**COCKTAIL AND DINNER**

TERRACE OF THE PALAIS DES CONGRÈS OF MONTREAL

6:00 PM - 10:00 PM  --- CLOSING CEREMONY AND OPAL-RT'S 20th ANNIVERSARY CELEBRATION!* Evening sponsored by Hydro Québec

*FORMAL ATTIRE PROPOSED
### FRIDAY, SEPTEMBER 8th

<table>
<thead>
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<th>Time</th>
<th>Activity</th>
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| 7:30 AM - 8:30 AM | Breakfast Sponsored by [phase]
| 8:00 AM - 8:05 AM    | Bus #1 pick-up of group #1                                             |
| 9:00 AM - 10:00 AM   | Hydro-Quebec Research Institute (IREQ) Visit – Group #1                  |
| 11:00 AM - 12:00 PM   | OPAL-RT Headquarters Visit & Poster Sessions                           |
| 9:00 AM - 9:05 AM    | Bus #2 pick-up of group #2                                             |
| 10:00 AM - 11:00 AM  | Hydro-Quebec Research Institute (IREQ) Visit – Group #2                  |
| 12:00 PM - 1:00 PM  | LUNCH Sponsored by [Hydro Quebec]                                       |
| 1:00 PM - 3:00 PM    | OPAL-RT Headquarters Visit & Poster Sessions continue                   |
| 3:00 PM - 3:30 PM    | Buses drive out, back to Le Westin, end of RT17                          |

Take advantage of this exclusive opportunity to visit IREQ’s freshly renovated test area for their long-distance high-voltage direct current (HVDC) line (RMCC), explore their facilities and speak with onsite experts.
Hydro-Québec generates, transmits and distributes electricity. Its sole shareholder is the Québec government. It uses mainly renewable generating options, in particular large hydro, and supports the development of other technologies—such as wind energy and biomass. A responsible corporate citizen committed to sustainability, Hydro-Québec carries out construction projects to prepare for the future. It also conducts R&D in energy-related fields, including energy efficiency. The company has four divisions.

Triphase is the number one company for real-time signal processing, networking and interfacing technologies for large-scale power electronics measurement and control. Their technologies are open, intuitive and robust. They offer best-in-class performance.

Triphase technologies connect software to power electronics sensors and actuators. As such, they connect their customers and their engineering partners to power electronics component manufacturers.

NI provides powerful, flexible technology solutions that accelerate productivity and drive rapid innovation. From daily tasks to grand challenges, NI helps engineers and scientists overcome complexity to exceed even their own expectations. Customers in nearly every industry—from aerospace and automotive to consumer electronics and advanced manufacturing—use NI’s integrated hardware and software platform to improve our world.
Gold sponsors

You may know Intel for its processors. But they do so much more. Intel invents at the boundaries of technology to make amazing experiences possible for business and society, and for every person on Earth.

Harnessing the capability of the cloud, the ubiquity of the Internet of Things, the latest in memory and programmable solutions, and the promise of always-on 5G connectivity, Intel is disrupting industries and solving global challenges. Leading on policy, diversity, inclusion, education and sustainability, we create value for our stockholders, customers, and society.

ABB is a pioneering technology leader that is writing the future of industrial digitalization. For more than four decades, we have been at the forefront, innovating digitally connected and enabled industrial equipment and systems. Every day, we drive efficiency, safety and productivity in utilities, industry, transport and infrastructure globally. With a heritage spanning more than 130 years, ABB operates in more than 100 countries and employs around 132,000 people.

Gentec designs, manufactures long-lasting and reliable solutions and customized products in the state-of-the-art electronics, power and energy management sectors. Gentec also offers services in research and development as well as electronic manufacturing to its various customers.

Since 1959 and largely thanks to the skill of its highly-skilled employees, Gentec has maintained its position as the market leader by working closely with its customers and imparting its expertise.
The company has been powering success for over 30 years by providing the most comprehensive and widely-used enterprise solution for generation, transmission, distribution, industrial, transportation, and low-voltage power systems.

Founded in 1986, ETAP is headquartered in Irvine, California, USA, with offices around the world.

Our mission is to provide state-of-the-art products and superior engineering services by combining advanced technologies with the highest standard in quality to achieve overall customer satisfaction.

Founded in 1986, ETAP is headquartered in Irvine, California, USA, with offices around the world.

AMETEK, Inc. is a leading global manufacturer of electronic instruments and electromechanical devices with annual sales of approximately $4.0 billion. AMETEK has over 15,000 colleagues at more than 150 manufacturing locations around the world. Supporting those operations are more than 100 sales and service locations across the United States and in 30 other countries around the world.
Imperix Ltd. is a company established in Sion, Switzerland. Its name is derived from the Latin verb imperare, which stands for controlling – or ruling – and refers to the company’s core business: the control of power electronic systems. It is a spin-off of the Swiss Federal Institute of Technology, Lausanne (EPFL).

Incorporated in 2013, the company is essentially a manufacturer of cutting-edge laboratory equipment, tailored for engineers active in the field of power electronics and smart grids.

**HIGHLIGHTED PRODUCT:**
Simple is beautiful is the guideline behind the BoomBox’s operating system! It contains just what is needed to control your converter, including protection, communication and real-time supervision. By avoiding the usual burden of conventional operating systems, control and interrupt frequencies up to several tens of kHz can be achieved, which brings high performance controls within everyone’s reach, including for the most complex converter topologies.

Wherever methods based on experience and innovation are put into action, where customers have high expectations regarding materials and technology and where European know-how blends with global structures, you will find Egston.

Pickering Interfaces designs and manufactures modular signal switching and simulation for use in electronic test and verification. They offer the largest range of switching and simulation products in the industry for PXI, LXI and PCI applications. Their products are specified in test systems installed throughout the world and have a reputation for providing excellent reliability and value.

**HIGHLIGHTED PRODUCT:**
Modular Breakout System - The Modular Breakout System is designed to simplify HILS (Hardware In the Loop Simulation) Applications. This low-cost system combines a BoB (Breakout Box) feature set with the added flexibility of an FIU (Fault Insertion Unit). By mating the FIU chassis directly to the BoB, cabling is minimized, creating a more compact reliable design and improving signal integrity. In addition, all cables to the simulation system and the UUT are located behind the front panel of the BoB. This creates a simpler front panel that is less prone to damage.
With an original position combining Production and Service R&D, expertise in the fields of power electronics, analog, measurement, digital and programming, Puissanc+ has been affirming itself for more than 20 years as a reference in the fields of: design of electronic equipment, energy conversion, instrumentation in power electronics, and integration of emulation systems.

Its industrial know-how is exercised within the framework of the business of critical systems and services. Its equipment are integrated into: production bench, on ground and embedded test equipment, system integration benches, testing laboratories, and tools for testing and maintenance.

Chroma supplies precision power conversion test instruments and automated systems to suit a variety of applications. From utilities, renewable energy, research and test facilities, Chroma products are trusted by the world’s leading R&D labs to provide consistent, fast and accurate measurements and tests. Chroma is well known for their programmable Regenerative Grid Simulator which has been designed to provide full 4 quadrant, fully regenerative, grid simulation with advanced features for PHIL, product verification, safety and compliance testing. With offices and manufacturing facilities located worldwide, Chroma is renowned for its commitment to excellence in product, service, and innovation.

Plexim specializes in solutions for the design and testing of power electronic systems with associated thermal management and controls. The company’s electrical engineering software PLECS provides a complete power conversion simulation platform that runs natively within MATLAB/Simulink, or as a standalone package. PLECS features a comprehensive library, with components from the electrical, thermal, magnetic, mechanical and control domains. Plexim’s portfolio also includes the PLECS Coder, RT Box and PLECS Processor-in-the-Loop (PIL) module.
We are one of the worldwide leading manufacturers for analogue linear transistor amplifiers, AC/DC current and voltage power supplies for industrial measurement and testing systems.

Our services extend from single amplifiers for AC and DC mains simulation to complex completely computer controlled testing and measurement systems. Based on our 4-quadrant linear power amplifiers we are able to simulate all supply voltages from DC to several hundred kHz with power up to the megawatt range.

HIGHLIGHTED PRODUCT:
The new APS amplifier series is a modern style 4-quadrant power amplifier with the capability to operate as source and as sink. In both conditions it can simulate a voltage as well as a current source. From 1kW up to 1MW – a wide power range is available. The linear design causes a very fast slew rate >52V/μs, a very low internal resistance and very high peak-load ability. The harmonic distortion is extremely low, even under high nonlinear conditions.

FMTP Power provides products, training and consulting that increases control over the network and thereby profitability for the power industry.

HIGHLIGHTED PRODUCT:
GridEx® is your personal assistant for Smart Grid networks and sets you in control of your IEC 61850 networks. It is a digital multimeter and analyzer for Smart Grids designed to support you when performing commissioning, troubleshooting and maintenance. GridEx® bridges the gap between the traditional power technology and the digital communication. Network digital data is translated into upfront and intuitive information to support decisions for increased reliability and improved system utilization. Entirely embedded stand-alone solution for secure connection to your IEC 61850 network, easy to use, versatile connections, instant start-up, error and inconsistencies detection, warning explanation, proactive analysis. The evolutionary tool in IEC 61850 testing. www.fmtppower.com

Based in Culver City, California, SCALABLE provides network design, modeling and analysis tools, cyber training systems and engineering support services to commercial enterprises, government and defense agencies, research organizations and educational institutions around the world. SCALABLE solutions integrate simulated virtual network models with physical hardware and applications, allowing users to reduce the time, cost and risks of developing, testing and deploying large, sophisticated wired and wireless networks and new communications equipment, and train personnel on cyber defense. More information on the company is available at scalable-networks.com.

HIGHLIGHTED PRODUCT:
EXata is a high-fidelity network emulation tool used to simulate and predict the behavior of networked environments based on various operational scenarios, including cyber-attacks. The emulation runs in real-time and models connections, computers, protocols, firewalls and other defenses. EXata provides a cost-effective and easy-to-use alternative to physical testbeds that typically have high equipment costs, complex setup requirements and limited scalability.