AGENDA





OPAL-RT's 13th Conference on Real-Time Simulation

Sept. 16-17, 2021 | 24h Conference Starting at 9AM ET



























Nodelon









Electro-Meters









Bangalore (IST) (CEST) Beijing (CST)	REGISTER NOW
5:00 18:30 21:00 BT31 Opening Session	
The second se	
6:00 19:30 22:00 Webinar: Cloud-Based Power System Digital Twins: The Next Decade of Innovation	
6:30 20:00 22:30 Etienne Leduc, Energy Market Offering Manager at OPAL-RT John Lemmon, Global Power & Utilities Leader Azure Energy at Microsoft Jean Bélanger, CEO & CTO at OPAL-RT Panel: Critical HIL Appli Jeferson Cintra, Business Devel Julien Rohmer, Automation	-
7:00 20:30 23:00 Panel: Validation of Power Electronic Industrial Applications through HIL François Tempez, Business Development at OPAL-RT Mathieu Giroux, Head of Product Engineering and Quality at ABB	opment Engineer at Embraer or at Rensselaer Polytechnic Institute
7:30 21:00 23:30 Geraldo Nojima, MV Power Conversion Chief Technologist at EATON Dr. Alex, Chair Professor, The University of Texas at Austin Dr. Hamish Laird, CTP at ELMG Digital Power Dr. Ilknur Colak, Head of Power Electronics at R&D Maschinenfabirk Reinhausen Educational and	d Training Tools
8:00 21:30 00:00 Panel: HIL Simulation and The Future of Grid and Microgrid Controls with Renewables Dr. Philippe Viarouge, Professor Electric Dr. Jean-Patrick Da Cost	or at Université Saint-Joseph de Beyrouth nd Researcher at Fraunhofer IEE trical Engineering at Université Laval
B:3022:0000:30Dr. Sudipta Chakraborty, Director - Energy Systems at OPAL-RT TECHNOLOGIES Dr. Ulrich Muenz, Principal Key Expert & Head of Autonomous Systems and Control at Siemens Dr. Sima Seidi, Principal Consultant - Microgrids and DERs at Tetra Tech Dr. Luis Miguel Costa, Head of Digital Solutions at Larsen & Toubro (L&T) Dr. Wei Sun, Associate Professor at University of Central Florida Dr. Fred Wang, Professor at University of TennesseePanel: Innovative Solutions for Aut Simula	
P:00 22:30 01:00 Panel: The Role of Power Hardware-in-the-Loop (PHIL) for the Power Systems Modernization	
9:30 01:30 01:30 Chris Genganantha, Channel Manager at OPAL-RT TECHNOLOGIES Sebastian Hubschneider, Researcher at Karlsruhe Institute of Technology (KIT) Olivier Tremblay, Researche negineer at Hydro-Québec (IREQ) Jay Johnson, Principal Member of Technical Staff at Sandia National Laboratories Georg Lauss, Researcher at Austrian Institute of Technology (AIT) Panel: How Hardware-in-the-Loop is A Development, Testi	
D:00 23:30 02:00 Panel: Cybersecurity on Power Systems Christine Van Slyke, VP Sales and Marketing at SCALABLE Network Technologies Dr. Manohar Chamana, Instructor at Texas Tech University	
0:30 00:00 02:30 Dr. Davood Babazadeh, Lecturer at Hamburg University of Technology Dr. Mike Mekkanen, Assistance Professor at University of yaasa Dr. Charalambos Konstantinou, Assistant Professor at KAUST TBA	BA

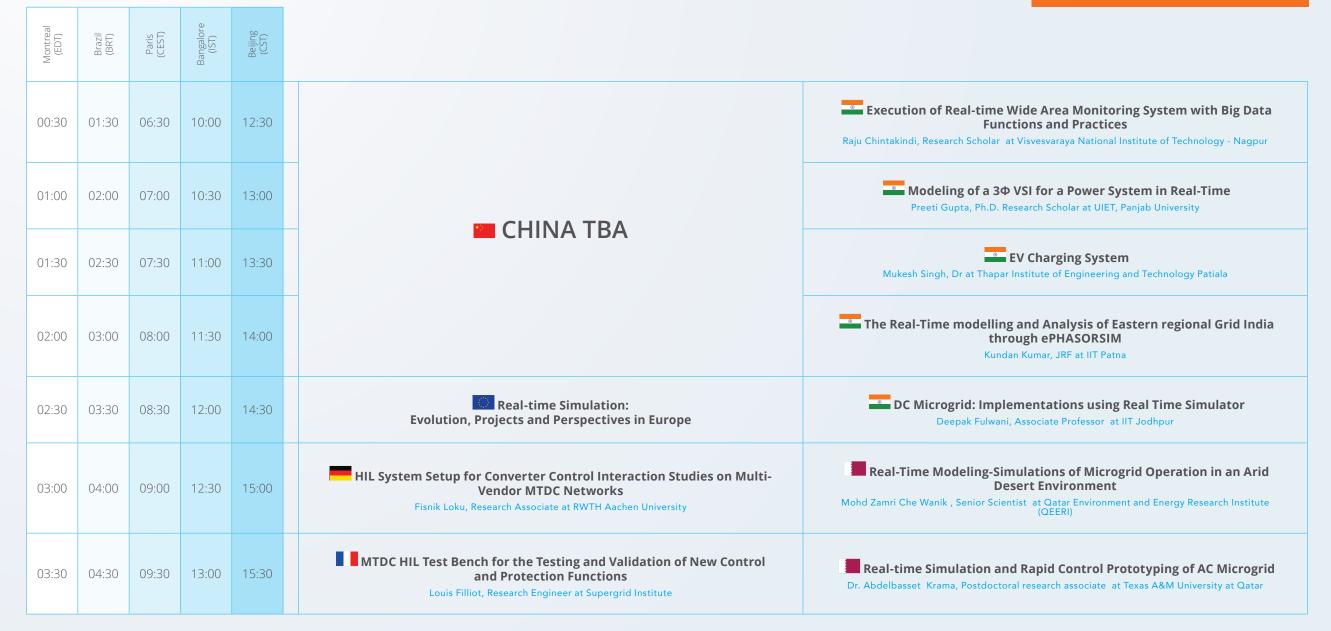


Montreal (EDT)	Brazil (BRT)	Paris (CEST)	Bangalore (IST)	Beijing (CST)				
15:00	16:00	21:00	00:30	03:00	Hydro-Québec (TBC)	ТВА		
15:30	16:30	21:30	01:00	03:30				
16:00	17:00	22:00	01:30	04:00	Smart Inverter Development and Testing Nayeem Ninad, Research Engineer at CanmetENERGY, NRCan	Simulation of power electronics in HYPERSIM to show the benefits of faster PMUs algorithms José Eduardo Alves Junior , Researcher at CEPEL		
16:30	17:30	22:30	02:00	04:30	Testbed Development for Real-Time HIL Demonstration for Flexible CHP Systems Alok Kumar, Student at Virginia Tech	Bancada multiterminal PHIL (Power Hardware in the Loop) do Laboratório de Redes Elétricas Oscar Solano Rueda, Research Engineer at CEPEL		
17:00	18:00	23:00	02:30	05:00	A generic method for interfacing IEDs using low voltage interfaces to real-time simulators Emilio Piesciorovsky, Technical Professional Staff / Lab Space Manager at Oak Ridge National Laboratory	New Modular Multilevel Converter Topologies using an OPAL-RT Reconfigurable MMC Testbed Matias Diaz, Associate professor at University of Santiago of Chile		
17:30	18:30	23:30	03:00	05:30	Role of Real Time Digital Simulation in Performing the Data Analytics for Utility Networks Sanjeev Pannala, Research Assistant Professor at Washington State University	Adaptative Scheme of LS as Function of Voltage and Frequency Using Digital Simulation in RT Bolívar Escobar, Electrical Engineer at Inproconfi		
18:00	19:00	00:00	03:30	06:00				
18:30	19:30	00:30	04:00	06:30	BREAK			
19:00	20:00	01:00	04:30	07:00				



Montreal (EDT)	Brazil (BRT)	Paris (CEST)	Bangalore (IST)	Beijing (CST)		REGISTER NOW
19:30	20:30	01:30	05:00	07:30		Real-time Applications in Australia: Project Overviews,
20:00	21:00	02:00	05:30	08:00		Trends and Perspectives
20:30	21:30	02:30	06:00	08:30		Sorrell Grogan, Principal Engineer at AusNet Services Dr. Behrooz Bahrani, Director of Grid Innovation Hub and Senior Lecturer at Monash University Felipe Arraño-Vargas, PhD Candidate and OPAL-RT's Ambassador at UNSW Sydney Chris Genganantha, Channel Manager at OPAL-RT TECHNOLOGIES Paul Moore, Head of Energy at SAGE
21:00	22:00	03:00	06:30	09:00		Paul Moore, Head of Energy at SAGE
21:30	22:30	03:30	07:00	09:30		Real-Time Hardware-in-the-Loop (HIL) Simulation: Use Cases and Applications in TNB Mohd Khairun Nizam Mohd Sarmin, Head (Power System) at TNB RESEARCH
22:00	23:00	04:00	07:30	10:00		Simulator Study on 500Hz MMC Convertor for Off-Shore Windfarm System Isao Iyoda, Ex-professor at Osaka Electro-Communication University
22:30	23:30	04:30	08:00	10:30	CHINA TBA	• Evaluation of Short-circuit Protection Units for an Inverter Based Distribution Network Yosihinobu Ueda, Senior Engineer at Meidensha Corporation
23:00	00:00	05:00	08:30	11:00		Hardware-in-the-Loop Verification and Test System for Electric Vehicle Battery Management Kevin Kuo, Application Engineer at CYBERNET Systems Taiwan
23:30	00:30	05:30	09:00	11:30		Power Quality Improvement of Grid-Tied Solar PV System with Synchronization Capability Pavitr Shukl, Ph.D. Research Scholar at IIT Delhi
00:00	01:00	06:00	09:30	12:00		Power Control in DFIG based Wind Energy Conversion System Prangya Pradhan, Research scholar at NIT Rourkela







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04:00	05:00	10:00	13:30	16:00	Real-time Simulation for Sector-Coupling: Opportunity and Challenges Davood Babazadeh, Lecturer at Hamburg University of Technology	Modular Multilevel Converter (MMC) in DC Grids Yousef Nazih, Teaching assistant at Alexandria University
04:30	05:30	10:30	14:00	16:30	Virtual Drive System Control with Real Control Hardware Wojciech Jurczak, Power Hardware Engineer at Rockwell Automation	Wind Power Plant Digital Twin Dr. Ramon Blasco-Gimenez , Professor at Universitat Politecnica de Valencia
05:00	06:00	11:00	14:30	17:00	Automated Setup of Cyber-Physical Tests Beds for Validation of Large Scale Smart Grid Apps Catalin Gavriluta , Research Engineer at Austrian Institute of Technology (AIT)	Hardware-In-the-Loop (HIL) Validation of Energy Management System in ATENEA Microgrid Aitor Ollacarizqueta, Engineer at CENER
05:30	06:30	11:30	15:00	17:30	3D Wind Flow Model for Real-Time Wind Farm Co-simulation Johnny Chhor, Researcher at Ruhr University Bochum	Microgrid Solutions Using HIL Ruben Benedetti, Product Test Engineer at GE Renewable Energy
06:00	07:00	12:00	15:30	18:00	E.ON Energy Research Center Dr. Antonello Monti, Director of the Institute for Automation of Complex Power Systems at E.ON Energy Research Center	HIL for Validation of Harmonic Mitigation Provided by Grid- Connected PV Inverters Atheer Habash, Research Assistant at Swansea University
06:30	07:30	12:30	16:00	18:30	Parallel Operated VSC and LCC Schemes - HIL Study Marco Schudel, Power Electronics Engineer at RTE	External Intelligent MGC Development for Microgrid HIL Simulation Subject to Cyber-Attack Mike Mekkanen, Assistance Professor at University of Vaasa
07:00	08:00	13:00	16:30	19:00	Validating Inertia Emulation Controllers using Rapid Control Prototyping and PHIL Testing Shahab Karrari, Postdoctoral Researcher at KIT-ITEP	On Validation of Smart Grid Applications for Low Voltage Distribution Systems Florin lov, Associate Professor at Aalborg Universitet



Montreal (EDT)	Brazil (BRT)	Paris (CEST)	Bangalore (IST)	Beijing (CST)		
07:30	08:30	13:30	17:00	19:30	Real-time simulation activities and real-time based HIL simulation methodologies Georg Lauss, Researcher at Austrian Institute of Technology (AIT), Denis Vettoretti , Junior Research Engineer at Austrian Institute of Technology (AIT)	Real-Time Simulation of Complex Converters Models and Fast Converter Start-Up Daniel Santamargarita , PhD Researcher at Uneversity of Alcala de Henares
08:00	09:00	14:00	17:30	20:00	Modeling and Stability Analysis of Converter-Dominated Grids with Dynamic Loads Huoming Yang, Research Assistant at Technische Universität Berlin	Design of Distributed Control Systems for Microgrids Marcos Eduardo Victorio, PhD Student at Durham University
08:30	09:30	14:30	18:00	20:30	RT21 Closing session	
09:00	10:00	15:00	18:30	21:00		

On Demand Presentations

Some of the RT21 speakers have created on-demand video presentations for you to access at any time! On-demand presentations will be available at the beginning of the event.

UPS HIL Testbench and Gs Understanding Ricky Zhang, Firmware Test Section Manager at Schneider Electric	Microgrid development and real-time validation from the lab to a real installation Mathieu Plourde, Global Product Manager at Festo Didactic	Validation of a Model Predictive Control Algorithm in a Hardware-in-the-Loop Simulation Sebastian Raczka, Research associate at TU Dortmund University	OPF Driven UFLS in Low-Inertia Power Grids Hosting Large-Scale BESSs Yihui Zuo, Doctoral Assistant at Ecole Polytechnique Fédérale de Lausanne
Digital Twin of a Power Network: Development, Validation, and Application Daniele Carta, Postdoctoral Researcher at Forschungszentrum Jülich	Three-Phase Grid-Connected PV Power System using a Modified Dual-Stage Inverter Ashkkumar S., Student at PSG College of Technology	Shortened Development Cycle of Battery Electric Vehicle using Virtual Testing Solution Abhishek Singh, Senior Solution Engineer at AVL List GmbH	Data-Driven Microgrid Control and Validation through Real-Time Simulation and PHIL Setup
Real-Time Simulation on Grid Integration of Electric Vehicle Wireless Charging Rong Zeng, Technical Professional Staff at Oak Ridge National Laboratory	Design and Development of a Wind Turbine Emulator using Separately Excited DC Motor Balaji Mendi, Research Scholar at National Institute of Technology Rourkela	Synchronous Generator and Excitation System Tesponse to GIC Pitambar Jankee, PhD Student at University of Cape Town	Maria Raboaca, Researcher at ICSI Rm. Valcea
Near Real-Time Transient Stability Analysis using Deep Learning Approach Sumathi Lakshmiranganatha, PhD Researcher at University of Wyoming	Real-Time RMS-EMT Co-Simulation and its Application in HIL Testing of Protective Relays Renzo Espinoza, Researcher at Itaipu Technological Park	Real-time simulation of Power System Wide Area Protection Algorithm Bright Tetteh, PhD Student at University of Cape Town	Energy Management of Hydrogen-based Microgrid Daniela Yassuda Yamashita , R&D Engineer at H2Gremm Myriam Jendoubi , R&D Intern at H2Gremm
Data-Driven Microgrid Control and Validation through Real-Time Simulation and PHIL Setup Seyed Sohail Madani, PhD Student at EPFL			

Platinum sponsors



Hydro-Québec's mission is to deliver reliable electric power and high-quality services. By developing clean, renewable energy sources, we make a strong contribution to Québec's collective wealth and play a central role in the emergence of a low-carbon economy. As recognized leaders in hydropower and large transmission systems, we export clean, renewable power and leverage our expertise and innovations within Québec and around the world.

Hydro-Québec is the only electric utility in North America to have a research centre the size of IREQ. The company invests a yearly average of \$100 million in its innovation projects. The IREQ team is made up of approximately 500 people: a broad range of scientists, technicians, engineers and specialists pool their efforts and expertise to support Hydro-Québec in every facet of its operations, from electricity generation to consumption.

intel

Intel (Nasdaq: INTC) is an industry leader, creating world-changing technology that enables global progress and enriches lives. Inspired by Moore's Law, we continuously work to advance the design and manufacturing of semiconductors to help address our customers' greatest challenges. By embedding intelligence in the cloud, network, edge and every kind of computing device, we unleash the potential of data to transform business and society for the better.



Since 2000, KeLiang has been concentrating on simulation & test technology and committing itself to providing reliable control system R&D and testing products, system-level solutions, and consultation services to global professional users in the industries of electric power, avionics, automobile, marine, rail, certification, etc.

The company's business covers the full life cycle of projects, including requirements analysis, collaborative development, model-based system R&D consulting, system integration & project implementation, training, and on-site technical services. After years' accumulation and dedication, KeLiang has bloomed into a market-leading supplier in the industry, offering professional engineering services and simulation & test systems like Integrated Energy Simulation System (IESS), SIL. PRCP, PHIL, TestBench and so on., SIL. PRCP, PHIL, TestBench and so on.

Gold sponsors



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We believe in the power and potential of making connections—between people, ideas, and technology. In fact, connection is central to everything we do. We constantly challenge ourselves to find those connections because that's what creates a path forward. This means bringing the right people together to build solutions that make a difference. It means combining fresh perspectives with new technologies to turn your vision into reality.



Lucas-Nülle stands for training systems for key technologies such as electrical engineering, automation or mechatronics. Whether individual training systems or entire laboratories – we are your full-service partner in 18 technical fields. Our own subsidiary in the USA, together with over 60 international sales partners, form a worldwide training network. Lucas-Nülle training systems combine teaching equipment with digital learning software. The result are competences imparted to trainees, pupils and students – also in the new topics of digitalisation.



ETAP is the global market and technology leader in modeling, design, analysis, optimization, monitoring, control, and automation software for electrical power systems.

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Festo Didactic is the world-leading provider in the field of technical education. As a global partner for educational institutions, governments, state organizations and companies around the world, they design and implement training centers and laboratories, educational equipment and programs that train people to perform in highly dynamic and complex environments. The product and service portfolio offers customers holistic education solutions for all areas of technology in factory and process automation, such as pneumatics, hydraulics, electrical engineering, power systems, renewable energies, production technology, mechanical engineering, mechatronics, CNC, HVAC and telecommunications.



Austrian-based EGSTON Power Electronics offers a revolutionary power electronic test bench based on P-HIL technology (Power – Hardware in the Loop). Our unique Compiso system offers a high voltage bandwidth of 5 kHz at 440 VRMS which can generate harmonics of up to 15 kHz with a power range of 100kW up to several megawatt. Based on a modular design, the Compiso P-HIL System offers full flexibility and can be used as an AC source/sink, DC source/sink, smart grid, aerospace grid, PV-panel, battery or electrical machine emulator.



Realtimewave is an experienced supplier of real-time avionics SIL (System Integration Laboratory), HILS (Hardware In the Loop Simulation) and ATE (Automatic Test Equipment) systems for the Defense & Aerospace industry. We have key technologies and diverse experience in the development of avionics systems including SIL, HILS, manned and unmanned (UAV) weapons test benches, missile guidance control HILS, satellite launcher SIL, autonomous vehicle control HILS. We have manufacturing, integration, and testing capability for avionics equipment and flight control equipment.



For over 30 years, Pickering has been helping test engineers design, deploy and sustain high-performance electronic test and verification systems. As a global specialist in high-quality modular signal switching and simulation, software and services for PXI, LXI, USB and PCI applications, we provide the engineering capabilities and worldwide resources you need to succeed. Our core focus is high-density modular switching and simulation systems (with over 1,000 products in PXI alone) to meet your specifications. And, when our product range doesn't fit your application, we have the agility and expertise needed to develop a system to your specifications, with little to no engineering cost. That's our specialty. At Pickering, we are focused solely on helping you design, deploy and sustain your automated test switching system

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SCALABLE Network Technologies has developed a family of software products for engineers, analysts, and operators of mission-critical, business-critical environments to help ensure the networks, the networked systems, and the distributed applications work effectively under all normal and emergency operating scenarios. Our network digital twin solutions integrate software virtual networks with physical hardware and applications, allowing users to rapidly test a wide range of highly realistic scenarios for better operational planning, more effective training and enhanced communications effectiveness without the expense of building out physical infrastructure. SCALABLE's simulation software is used by commercial, government, military, and educational organizations around the world.



PONOVO POWER is the professional protection relay testing and power amplifier products provider, mainly including PHIL (power-hardware-in-loop) power amplifier solution, conventional power amplifier for power system, linear type 4-quadrant power amplifier for new engery research, EV charging facilities testing platform, protection relay test sets(6-hase, 3-phase), CT/PT Analyzer, single phase tester, primary injection, HVDC, railway transportation related testing devices, etc. PONOVO Power as an ISO 9001-2015 certified company, founded in 1998 and started international sales for more than 10 years. We have been supplying more than 1500 sets of testing device to more than 50 countries.



Along with technological development and the birth of Industry 4.0 the world needs better educated people. The traditional educational methods and approaches are no longer effective and do not provide the required knowledge and expertise to future specialists. The educational trainers should be transformed from a fixed, static trainer into open, flexible and software defined platforms. Biltlismen's Power Labs Ecosystem comes to fulfill these needs. It is designed to be expandable, reconfigurable and reprogrammable. The ecosystem consists of: Solar, Wind, Hydrogen Fuel Cell, Hydro, Traditional Power Generation Trainers; Transmission, Distribution, Substation Automation, Electromechanical and Microprocessor Relay Protection Trainers; Smart Grid Platform. To check more about our company and products please visit www.bitlismen.com and www.youtube.com/bitlismen



Modelon offers systems modeling and simulation software that accelerates product innovation, development, and operations in a range of industries. Modelon's flagship product, Modelon Impact, is a cloud-native system simulation software platform featuring a collaborative browser-based interface and thousands of proven models and components spanning a broad range of applications. With global reach, Modelon is an expert industry leader in model-based systems engineering with a focus on leveraging open standard technologies. Modelon Library Suite, Modelon Inside, and FMI Toolbox are leading solutions, integrated and available on several industry recognized platforms. Our products, regardless of platform, enable us to serve a clientele, base across a wide range of industry sectors, which include some of the largest companies in the world.

imperix

Imperix is a Swiss company developing high-end control equipment and prototyping hardware for power electronics, drives, smart grids and related topics. Its products are designed to enable cutting-edge innovation in corporate and academic environments. They are especially valued for their ability to accelerate the implementation of laboratory-scale power converters and facilitate the derivation of high-quality experimental results. The company also offers various levels of integration services, intended to assist its customers in their prototyping activities. As such, its offering ranges from the delivery of plug-and-play hardware and software, to that of fully customized systems involving specialized control software algorithms. For more information, visit http://www.imperix.com



EMTP® is the most complete and technically advanced software for simulation and analysis of power systems. EMTP® is the reference for the simulation of electromagnetic and electromechanical EMT transients. It is known to be the fastest, the most accurate and the most numerically stable time-domain software in the industry. Control systems and protections can be modelled in detail using the complete libraries of components. EMTP® has a powerful unbalanced multi-phase load-flow capable of solving very large scale transmission and distribution grids, cases with more than 300 000 buses can be solved by our EMT solver. EMTP® has the most user-friendly graphical interface and load-flow, steady-state and time-domain simulations using the same grid data and within the same environment. EMTP® is completely scriptable. EVERYTHING that can be done by hand can be automated by scripts!



As a professional manufacturer of power electronics testing instruments and systems, ITECH has brought to the market over 700 products including AC/DC programmable power supply, AC/DC programmable electronic load, regenerative power system, gird simulator, bidirectional DC power supply, battery tester, battery simulator, PV simulator, power meter, battery IR tester, power system, etc. ITECH also provides more than 20 solutions which can be applied to different industry areas, such as EV,solar, automotive electronics, semiconductor, education, 5G, IoT... Every year, there will be at least 6 new products to be launched to the market. Like IT6000B/C/D series, featured as high voltage (max.2250V),high power (max. 1.152MW) and multiple functions. we also low power products Like IT-M3600/IT-M3400(bidirectional), IT-M3200(high precision)... ITECH, Your Power Testing Solution.

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Neosoft Technologies is a software and electronic engineering company specialized in system integration involving instrumentation and control. Neosoft has proven its expertise in a variety of system delivered including high-speed data acquisition and analysis, embedded systems, machine vision system, Hardware-in-the-loop (HIL) simulators, automated test systems (ATE), database and geographic information system (GIS) systems. Neosoft have a great team of qualified professionals in the field of Software and Electronics ready to help for your simple and complex projects.



Cluster for Electric and Smart Transportation Propulsion Québec est la grappe des transports électriques et intelligents du Québec qui mobilise tous les acteurs de la filière autour de projets concertés ayant pour objectif de positionner le Québec parmi les leaders du développement et de l'implantation des modes de transport terrestre favorisant les transports électriques et intelligents. Créé en 2017, Propulsion Québec compte aujourd'hui près de 215 membres de différents secteurs et déploie ses ressources selon six chantiers distincts visant à développer et soutenir des projets innovants. La grappe bénéficie de l'appui financier du gouvernement du Québec, du gouvernement du Canada, de la Communauté métropolitaine de Montréal (CMM), d'ATTRIX, du Mouvement Desjardins, du Fonds de solidarité FTQ, d'Hydro-Québec et de Québecor.



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