OPAL-RT TECHNOLOGIES

AGENDA

RT23

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OUR ENERGY

OPAL-RT's 15th International
Conference on Real-Time Simulation

November 13-16, 2023

Lisbon, Portugal

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Agenda

DAY 1 - MONDAY, NOVEMBER 13th

	MILAO I	MILAO II
13:00 - 15:00	Tutorial : HIL Simulation basics Setting up and automating a hardware in-the-loop experiment by Yahia Bouzid, OPAL-RT University Manager	Tutorial : Power-HIL in theory and practice Stabilizing the closed loop by Sebastian Hubschneider, OPAL-RT R&D Engineer
15:00 - 15:30	**BREAK**	
15:30 - 17:30	Tutorial : Bridging domains: Transient Electromagnetic / Phasor co-simulation Simulating power systems without compromise by Steffen Vogel, OPAL-RT Software specialist	Tutorial: Power Electronics simulation with eHS Gen5 The fast and the furious 2 by Marija Stevic, OPAL-RT R&D Engineer
18:00 - 20:00	**WELCOME RECEPTION** (MEZZANINE)	

DAY 2 - TUESDAY, NOVEMBER 14th

	EUROPA
8:00 - 9:00	**BREAKFAST**
8:45 - 9:00	**WELCOME TO RT23** by Pierre-Francois Allaire, Executive General Manager, OPAL-RT Technologies
9:00 - 10:00	**KEYNOTE #1** by Jean Bélanger, CTO, OPAL-RT TECHNOLOGIES Frederic Monfet, Vice President Technologies, OPAL-RT TECHNOLOGIES Technology Advances Etienne Leduc, Offering Manager - Energy, OPAL-RT TECHNOLOGIES
10:00 - 10:30	**KEYNOTE #2** Energy transition and power system simulation – a European view by Bernd Klöckl, Head of the Institute for Electrical Power Engineering and Sustainable Energy Systems, TU Wien
10:30 - 11:00	**KEYNOTE #3** How Power Conversion, a GE Vernova business, utilizes HIL simulators to validate controllers of medium voltage drives MV7 and MM7 for pumped storage hydro power plants, railway SFC and STATCOM applications by Dominik Hofmeyer, Manager of the "Drive Control, Engineering & Technology, GE Vernova´s Power Conversion Business
11:00 - 11:30	**MORNING BREAK & EXHIBIT** (LONDRES)

Agenda

DAY 2 - TUESDAY, NOVEMBER 14th

	EUROPA	ROMA I	ROMA II
	GRID OPERATION, STABILITY AND DIGITAL TWINS	PROTECTION AND CONTROL FOR POWER SYSTEMS	ENERGY CONVERSION / POWER ELECTRONICS
11:30 - 12:00	Commissioning of Electrical Substation-Grid Test Bed with IEDs and Cyber-Grid Guard by Emilio Piesciorovsky Oak Ridge National Laboratory, USA	Integration Tests of an Adaptive Protection System in a Hardware in the Loop Testbed by Immanuel Hacker IAEW at RWTH Aachen, Germany	Advancement and Updates in eHS by Sébastien Cense, Head of Division - Simulation FPGA, OPAL-RT TECHNOLOGIES
12:00 - 12:30	Incremental Prototyping Approach of Control Solutions for Local Energy Communities by Daniele Carta, Forschungszentrum Jülich, IEK-10, Germany	Real-Time simulation to Test Hybrid State Estimation and WAMPAC Functionalities by Eric Glende, Otto-von-Guericke-University Magdeburg, Germany	HIL validation of Isolated DC-DC converter in a MVDC Network by Titouan Abiad Supergrid Institute, France
12:30 - 13:00	Development of µController for Shore to Ship Power: Battery Energy Storage Controller CHIL by Mike Mekkanen & Tero Vartiainen University of Vaasa, Finland	Distance and Differential Protections HIL Testing by Joaquin Pulido & Christophe Pulido SCLE SFE, France	Accelerated Development of Test System for EV Battery Packs and Charging Equipment by Andrey Popov, Keysight Technologies Deutschland GmbH, Germany
13:00 - 14:00	**LUNCH & EXHIBIT - (LONDRES)**		
14:00 - 14:30	Experience with Hypersim on Developing Digital Twins of Modern Power Grids by Vinicius Lacerda CITCEA-UPC, Spain	Communication Performance Testing for Special Protection Scheme (SpPS) by Jirapa Kamsamrong OFFIS Institute, Germany	Challenges in Real-Time Simulation of Smart Transformers by Marius Langwasser Kiel University, Germany
14:30 - 15:00	Developing a Digital Twin of a Multi Sector Energy Supply System for Controller Testing by Christian Seitl, AIT Austrian Institute of Technology, Austria	Pre-commissioning Renewable Aggregated Generator Control Systems Using Real-Time Simulation by Marty Johnson EPEC Group, Australia	Aircraft Actuation System Development with Power Electronics FPGA-based Motor Model by Pawel Jastrzebski & Anna Koziol Woodward, Poland
15:00 - 15:30	NREL ARIES Project by Rob Hovsapian,NREL National Renewable Energy Lab, United States	Using Hypersim to Build Virtualization Environments for Energy System Resilience Studies by Rawad Zgheib, Hydro-Québec Research Institute (IREQ), Canada	Real-Time Simulation of Three-Phase Dual-Active Bridge by Raphael Mencher RWTH Aachen, Germany
15:30 - 16:00	**AFTERNOON BREAK & EXHIBIT - (LONDRES)**		
16:00 - 16:30	Coordination of Congestion Management between Transmission and Distribution Networks by Hui Cai TU Ilmenau, Germany	Laboratory Hardware-in-the-Loop Implementation of Centralized Protection and Control by Everton Leandro Alves INESC TEC, Portugal	Real-Time Simulation of Power Electronics with the Exponential Integrator by Jared Paull UBC Okanagan, Canada
		MICROGRIDS	E-MOBILITY AND TRANSPORTATION
16:30 - 17:00	Empowering Energy Sector Coupling: CHIL-based Laboratory Setup for Testing Real-Time Grid Operation by Alfio Spina TU Dortmund University, Germany	Resiliency Enhancement of Microgrids Through Real-Time Coordination of Fault Detection by Hani Muhsen German Jordanian University, Jordan	*Advancing Electric Vehicle Supply Equipment Through Controller Hardware-in-the-Loop Valida by Sertac Bayhan Hamad Bin Khalifa University, Qatar
17:00 - 17:30	The Year to Forge a Fine Sword for Renewable Energy HIL Market in China by Weihua Wang, Technical Director, OPAL-RT China	Real-Time Simulation of an Islanded Microgrid System for Renewable Hydrogen Production by Janito Ramos LAFAE/COPPE/UFRJ, Brazil	Coming Soon
18:00 - 20:30	**TUK TUK TOURS**		

Agenda

DAY 3 - WEDNESDAY, NOVEMBER 15th

	EUROPA
8:00 - 9:00	**BREAKFAST**
9:00 - 9:30	**KEYNOTE #4** Using Drives Converter as Powerful MV Amplifier - A Story about Using HIL by Marcin Szlosek, R&D Director, ABB
9:30 - 10:00	**KEYNOTE #5** by Nuno de Souza e Silva, Managing Director, R&D Nester
10:00 - 10:30	**KEYNOTE #6** Vision-guided Autonomous Lunar Lander Simulation - a Hardware-in-the-Loop (HIL) Simulation by Amitava Gupta, Professor, Dept. of Power Engineering, Jadavpur University, Kolkata
10:30 - 11:00	**MORNING BREAK & EXHIBIT - (LONDRES)**

	EUROPA	ROMA I	ROMA II
		POWER HARDWARE-IN-THE-LOOP	INVERTER BASED RENEWABLES INTEGRATION
11:00 - 11:30	Net-Zero-CO2 by 2050 is NOT Enough(!) by Timo Roesch Director, Business Development and Marketing, OPAL-RT Germany	The Transformative Impact of CHIL on the Development of Hydro-Québec's PHIL System by Olivier Tremblay Hydro-Québec Research Institute (IREQ), Canada	Emulating EV Charging Performance using Real-Time Simulation by Keith Davidson National Renewable Energy Laboratory, United States
	ADVANCES IN REAL-TIME SIMULATION TECHNOLOGY AND TECHNIQUES		
11:30 - 12:00	**EDUCATIONAL PANEL SESSION:** (1 hour) How can Hardware-In-the-Loop methodology empower future engineers for disruptive technologies? Moderator: Yahia Bouzid, OPAL-RT University Manager Panelists: Ron Brandl, Fraunhofer IEE, Germany Djaffar Ould Abdeslam, University of Haute Alsace, France Danielle Nasrallah, Offering Manager - Courseware, OPAL-RT TECHNOLOGIES	Development of a PHIL Test System with a Pre-trained AI-based Load and Charging Management by Andreas Stadler Helmut Schmidt University/University of the Bundeswehr Hamburg, Germany	HIL Simulation Tests for Electrical Certification of Wind Turbines on Test Benches by Adam Zuga Fraunhofer IWES, Germany
12:00 - 12:30		Advanced Testing Strategy for Impedance Based Stability Investigation Using Novel Impedance Replication Method by Trung Do, morEnergy, Germany Christoph Klie, TUHH, Germany	X-in-the-Loop Test Environment for Standardized - Development of Photovoltaic Inverters by Derk Gonschor Bonn-Rhein-Sieg University of Applied Sciences, Germany
12:30 - 13:00	OPAL-RT as your Partner for Publicly Funded R&D Projects - Updates and Advancements by Ravinder Venugopal, Vice-President Business Development and R&D - Europe and Midle East - OPAL-RT	Energy Management Systems: Design of a Laboratory Setup for PHIL Considering RT Simulation by Abdelilah Rochd Green Energy Park, Morocco	Transcending Concept to Realization: Accelerated Development for Grid-Forming Control by Jonas Steffan Fraunhofer IEE, Germany
13:00 - 14:00	**LUNCH & EXHIBIT - (LONDRES)**		
14:00 - 14:30	Geographically Distributed Real-Time Co-Simulation to Support the Brazilian Interconnected Power System Operation by Loan Silva ONS, Brazil	Smart-Integrated-Grid: PHIL Island Grid Comprising Electric and Hydrogen Systems by Edgar Diego Gomez Anccas Helmut-Schmidt-University, Germany	HIL Validation of Advanced Voltage Controller of DC/DC Converters in an MTDC Grid by Asimenia Korompili, Institute for Automation of Complex Power Systems, EON ERC, RWTH Aachen University, Germany
14:30 - 15:00	Framework For Assessment of Geographically Distributed Simulations of Electrical Systems by Gabriel Antero LAFAE/COPPE/UFRJ, Brazil	RCP of Fuel Cell Powered Multi-Strand Propulsion Systems For Electric Aircraft by Lukas Baum Helmut Schmidt University/University of the Bundeswehr Hamburg, Germany	Optimization of the Parameters of Under-Frequency Load Shedding Schemes and Grid forming by Francisco Gonzalez-Longatt DIgEnSys_lab - Loughborough University - University of South Eastern Norway, UK

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DAY 3 - WEDNESDAY, NOVEMBER 15th

		EUROPA	ROMA I	ROMA II
		ADVANCES IN REAL TIME SIMULATION TECHNOLOGY AND TECHNIQUES	POWER HARDWARE-IN-THE-LOOP	CYBERSECURITY
15:00 - 15:30	—	Establishing an IEEE Recommended Practice "The P2004 WG" by Georg Lauss AIT Austrian Institute of Technology, Austria	Insights on Laboratory-Scale DC System Validation with PHIL and RCP by Marc René Lotz Ostfalia University, Germany	OPTILE: A Collaborative Project for the Optimisation and Simulation of Isolated Electrical by Florian Dupriez-Robin France Énergies Marines, France
15:30 - 16:00	—	**AFTERNOON BREAK & EXHIBIT - (LONDRES)**		
16:00 - 16:30	—	OPAL-RT Simulators – A Key Component in Power Technology Research at KIT by Felix Wald Karlsruhe Institute of Technology, Germany	HIL Assisted Design for PHIL Real-Time Electrical Machine Power Emulation by Nicolas Eugenio Lima Basquera Roma Tre University, Italy	(1 hour) Automated Cyber-Physical Staging Environment for Validating Smart Grid Software Ecosystems by Catalin Gavriluta & Denis Vettoretti Austrian Institute of Technology, Austria
16:30 - 17:00	—	On-line Monitoring of Maximum Temperature and Loss of a MFT using FEM, ANNs and OPAL-RT by Daniel Santamargarita Mayor University of Alcalá, Spain	Interaction Between Grid-Forming Converter and Synchronous Machine - PHIL Validation by Frédéric Colas L2EP/Arts et Métiers, France	
17:00 - 17:30	—	Efficient p-q Theory-based Load Modelling for Real-Time Simulations by Karthik Rajashekaraiah Karlsruhe Institute of Technology, Germany	Frequency-Watt Algorithm Employment for Grid-Connected Microgrid Using PHIL Simulations by Mohamed Laamim Green Energy Park, Morocco	
17:30 - 17:50	—	**CO2 CONTEST FINALIST PRESENTATION**		
19:00 - 23:00	—	**GALA DINNER & AWARDS - (MONSANTOS OPEN AIR)**		

DAY 4 - THURSDAY, NOVEMBER 16th

9:00 - 13:00	—	**INDUSTRIAL VISIT R&D NESTER AND EDP**

Diamond sponsor

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.

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.

In KeLiang, we believe that every achievement we make will help to shape a better world. Every project, from design to completion, is not only the fulfillment of a system or ground-breaking ideas, but also our slight contribution to create a greener and smarter future!

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Innovation is deeply ingrained in Hydro-Québec. It drives ambitious projects within the organization's business units and as part of its main activities (generation, transmission and distribution of electricity, as well as construction).

Hydro-Québec also relies on its research facilities to stimulate innovation, promote synergy and remain at the leading edge of technology.

Scientists, technicians and engineers are among the 500 experts from a variety of specialties who pool their expertise in support of Hydro-Québec's business units in all aspects of their activities, from electricity generation to consumption.

www.hydroquebec.com

Realtimewave is an experienced supplier of real-time test and simulation system for validation & verification and modeling application. We have key technologies and diverse experience in the development of SIL (System Integration Laboratory), HILS (Hardware In the Loop Simulation) and test bench for Aerospace, Defense and Power Electronics and Power System. We also have manufacturing, integration, and development capability for various testing applications and industries.

http://www.realtimewave.com

Taraz Technologies has been providing research-oriented power electronics solutions to customers in more than 42 countries. Our products include Gate Drivers, Power Modules, Embedded Controllers, Isolated Sensors, Data Acquisition devices and as well as fully integrated Power Electronics Systems. We prioritize an intuitive, research-friendly, and modular design approach that expedites the R&D process while offering utmost versatility for experimentation. In addition, we produce Programmable Power Supplies and Solar Inverters to meet the diverse needs of industrial and consumer sectors.

Founded in 2012, Taraz was nominated among Pakistan's top most innovative technology startups. Our manufacturing and R&D facilities are located in Islamabad, Pakistan. Additionally, we've established a new manufacturing facility in Bursa, Turkey, to cater the growing demand for our innovative products.

https://www.taraztechnologies.com/

Silver sponsors

With more than 15 years of experience in the field, at Cinergia Power Solutions we focus on continuous innovation in order to offer the most efficient and technologically advanced solutions. We are a 100% R&D company, where the innovation and entrepreneurship are the basis of everything we do.

Our key areas of expertise include power electronics, DSP-based digital control of converters, communications and software interface (HMI). With this know-how and experience CINERGIA has created a comprehensive portfolio of solutions addressing the Testing needs in the fields of R&D, Power HIL, Validation and EoL applied to e-Mobility, Smartgrids, Energy Storage Systems, Batteries & Hidrogen and Aerospace.

CINERGIA's portfolio is formed by an IGBT platform covering applications from 7.5 to 1.2MW and a SiC platform specially designed for Power HIL applications from 22.5 to 400kW.

https://cinergiapower.com/en

We are a young, forward thinking Austrian company with deep roots & a strong history in innovating power electronics. We are the world leader in real-time emulation and test systems, combining several years of knowledge and experience with a creative out of the box mindset.

We emulate with real power. Grids, batteries, motors, generators & machines to name a few. Our programmable amplifiers and P-HIL systems can operate in several AC / DC & HIL-based modes. Current-control, voltage-control and mixed-mode capability with up to 15kHz bandwidth. From 100kVA to megawatt level.

Now EGSTON Power Electronics take real time simulation to the next level, creating systems for emulating and testing the most powerful electrical devices before even building the first prototype. We now proudly present "Digital Power Twin", the most advanced emulation platform currently available!

https://www.egstonpower.com/

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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.

https://www.ni.com/

PONOVO is a professional electrical testing instrument and solution provider based in Beijing, which was founded in 2001 and is the first protection relay test set and power amplifier company fully R&D and production in China. In the past 15 years, PONOVO has supplier thousands of testing equipment, including protection relay tester, single phase test set, CT Analyzer, Primary injection testing equipment, IEC61850 digital substation testing solution, PHIL power amplifier solutions, etc, to end users in electrical industry in more than 60 countries. We have both conventional linear type power amplifier and new switching-mode power amplifiers, 2-Quadrant and 4-Quadrant for different HIL and PHIL use in the customer sites in their lab.

https://www.ponovo.net/

SPHEREA PUISSANCE+ specialized in Power Electronics Products, provides cutting edge solutions for PHIL field. PUISSANCE+ provides Power Amplifiers from 150W to 500KW (More if necessary), based on both technologies, linear and switching techno. New Product PLUTON SERIES will be presented at RT23.

https://www.puissanceplus.com/

Spitzenberger is one of the worldwide leading manufacturers for analogue linear transistor amplifiers, AC/DC current and voltage power supplies for industrial measurement and testing systems.

https://www.spitzenberger.de/Home.aspx

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Innovative technology company from Hamburg with deep knowledge in power distribution grids and grid integration of renewable energies. A special focus is on the detection of resonances and other critical states within grid infrastructures. We create smart measurement solutions and generate digital twins of electrical systems and power infratructure.

https://morenergy.net/

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Imperix develops 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.

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