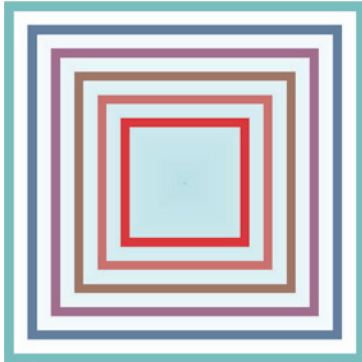


PROGRAMME

20th Power Systems Computation Conference



pssc2018
DUBLIN

June 11-15, 2018
University College Dublin
Dublin, Ireland

www.pssc2018.net

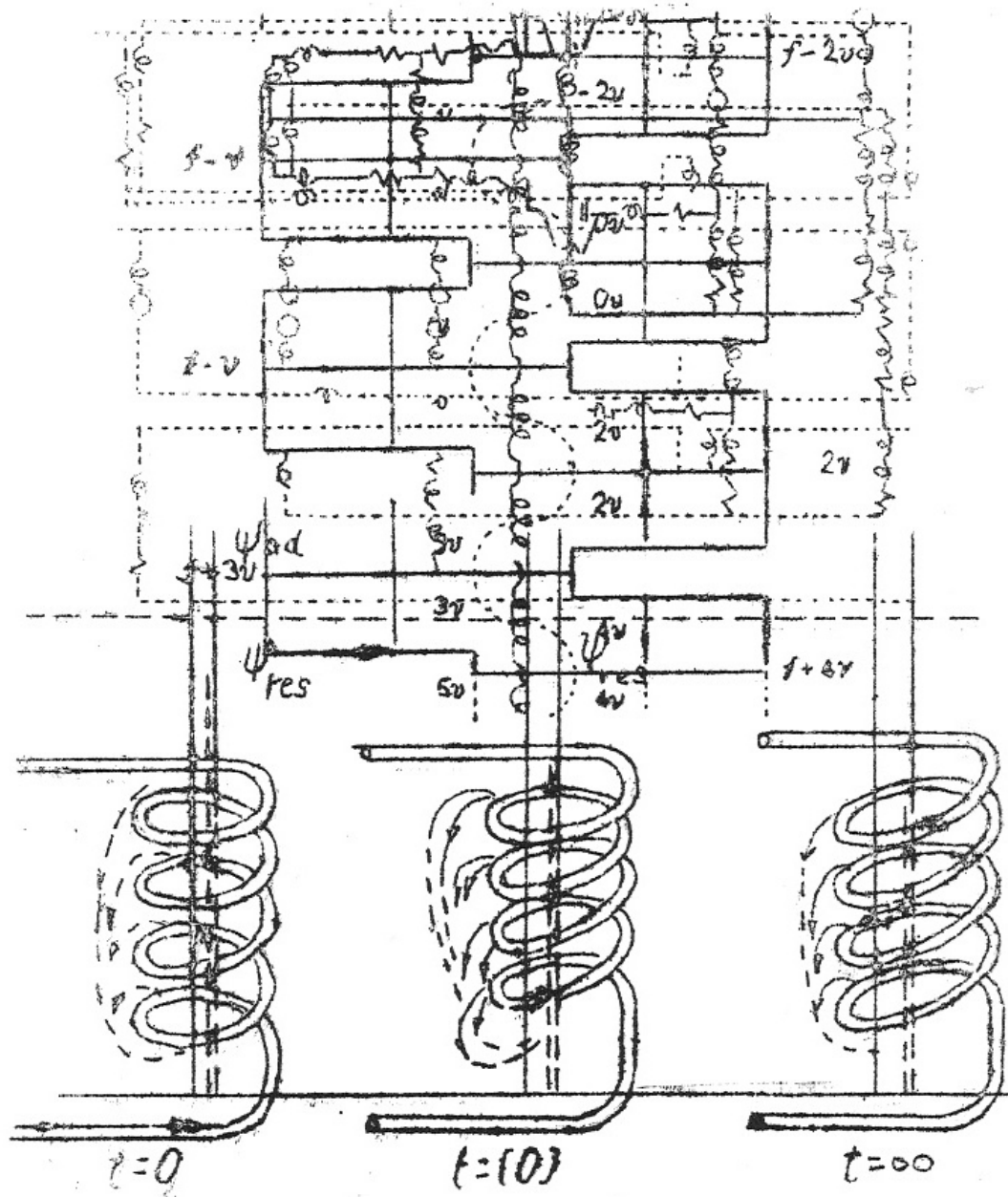


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WELCOME TO PSCC 2018 IN DUBLIN

With great pleasure the Local Organizing Committee, the PSCC Executive Board, the PSCC Council and the Technical Programme Committee invite you to the 20th Power Systems Computation Conference, to be held in Dublin, Ireland from 11th to 15th June 2018.

The Power Systems Computation Conference (PSCC) was the outcome of the needs, interests and almost natural steps seen by academics, power system planners and operators, as well as engineers dealing with computers in the power system area. The first PSCC, which can be called a conference took place in London in 1963 and subsequent conferences followed at three year intervals. Recently it has been decided to organize the Conference every two years. So far, nineteen editions of this Conference have been organized in different interesting locations in Europe and the 20th edition will take place for the first time in Ireland.

PSCC has developed into one of the most prestigious conferences in the area. The Conference gives to the international forum of researchers and power system engineers a great opportunity to exchange knowledge and experiences on the latest developments and applications in the field, from micro-grids to mega-grids. The emphasis is on modelling and simulation for understanding a system of components, plant or actors, the interactions between them and their collective behaviour, and methods to inform decision-making in power systems. The Conference welcomes both theoretical developments as well as practical applications in the utility and manufacturing industries.

PSCC has developed a fair and rigorous paper review procedure in order to ensure high scientific standards for the Conference. This is the main task of the Technical Programme Committee (TPC), which, since the very beginning of the PSCC, has always aimed at achieving the highest quality standards. All submitted papers are peer reviewed by an average of 4 experts. PSCC 2018 has received an exceptional number of final papers (about 530), which has led to a particularly challenging selection process for the TPC. The final selection of the best 224 papers will be presented from Tuesday 12th to Friday 15th June. PSCC 2018 is technically co-sponsored by IEEE and all accepted and orally presented papers will be submitted to IEEE Xplore digital library.

Altogether there will be 40 regular sessions and 2 survey papers on "Situational awareness and control of distribution systems and interaction with transmission system" and "Stability of transmission systems with low-inertia." The conference will be concluded with a plenary panel session on "Cybersecurity and cyber-physical power systems". Continuing the tradition of previous editions of the PSCC, a tutorial has been integrated within the conference fee, and we look forward to good participation on Monday 11th June for the tutorials on the theme "Modeling and applications of energy storage systems in power grids".

PSCC has also acquired a reputation as an instrument of building a social network where participants and accompanying persons can get to know each other and make new friends. Therefore, the social programme will be an important part of the Conference, including a welcome reception at University College Dublin, a conference excursion to Glendalough/Taylors Three Rock pub and a conference dinner in the Round Room at the Mansion House in Dublin city centre. The Local Organising Committee have endeavoured to put all the elements of this programme together to give a flavour of the history and culture of Dublin and Ireland. We believe that the Conference participants coming to Dublin from all over the world will have plenty of memorable experiences, making them look forward to meeting again at the next Conference.



FEDERICO MILANO

Chairman of the Local Organising
Committee of the PSCC 2018

PSCC COMMITTEES

President of the Council

Tomás Gómez, Institute for Research in Technology, Universidad Pontificia Comillas

President of PSCC 2018

Charles Trevor Gaunt, University of Cape Town

Executive Board of PSCC

Chair: Anjan Bose, USA

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Treasurer: Goran Andersson, Switzerland

Secretary: Wolfram Wellssow, Germany

Keith Bell, UK

Tharam Dillon, Australia

Louis Wehenkel, Belgium

Technical Programme Committee

Chair: Mario Paolone, Switzerland

Vice-Chair: Christian Rehtanz, Germany

Members

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Bell, Keith, UK

Bessa, Ricardo J., Portugal

Bialek, Janusz, Russia

Blanco, Gerardo, Paraguay

Borghetti, Alberto, Italy

Capitanescu, Florin, Luxemburg

Carvalho, Pedro, Portugal

Cherkaoui, Rachid, Switzerland

Cirio, Diego, Italy

Cutululis, Nicolaos Antonio, Denmark

Dent, Chris, UK

Ernst, Damien, Belgium

Funabashi, Toshihisa, Japan

Gawlik, Wolfgang, Austria

Gibescu, Madeleine, Netherlands

Guillaud, Xavier, France

Hill, David, Hong Kong

Hiskens, Ian, USA

Hug, Gabriela, Switzerland

Iravani, Reza, Canada

Kamwa, Innocent, Canada

Keane, Andrew, Ireland

Li, Yong, China

Low, Steven, USA

Mancarella, Pierluigi, Australia

Massucco, Stefano, Italy

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Milano, Federico, Ireland

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Noda, Taku, Japan

Nordström, Lars, Sweden

Nucci, Carlo Alberto, Italy

Olmos Camacho, Luis, Spain

Palma-Behnke, Rodrigo, Chile

Papavasiliou, Anthony, Belgium

Peças Lopes, Joao, Portugal

Phulpin, Yannick, France

Pinson, Pierre, Denmark

Preece, Robin, UK

Repo, Sami, Finland

Rouco, Luis, Spain

Rosolowski, Eugeniusz, Poland

Schegner, Peter, Germany

Silvestro, Federico, Italy

Simoës-Costa, Antonio, Brazil

Strunz, Kai, Germany

Taranto, Glauco, Brazil

Uhlen, Kjetil, Norway

Vadlamudi, Vijay Venu, Norway

Van Cutsem, Thierry, Belgium

Van Hentenryck, Pascal, USA

Van Hertem, Dirk, Belgium

Vournas, Costas, Greece

Witzmann, Rolf, Germany

Zdrallek, Markus, Germany

Zeng, Peter, China

PSCC COMMITTEES

Local Organising Committee

Chair: Federico Milano, Ireland
Vice-Chair: Terence O'Donnell, Ireland
Vice-Chair: Andrew Keane, Ireland

Members:

Damian Flynn, Ireland
Paul Cuffe, Ireland

Meetings of PSCC bodies

Meetings will take place on Monday 11th June 2018 in Room H0.22 in the O'Brien Centre for Science.

14:00-15:30 TPC + Chairpersons
15:30-15:50 Coffee break
16:00-17:30 Executive Board
18.00 - 19:30 PSCC Council

PLENARY AND SPECIAL SESSIONS

Monday 11th June, 9:15 – 17:20 Moore Auditorium

Tutorial: Modeling and applications of energy storage systems in power

TS1: Energy storage fundamentals and modelling
TS2: Stability and control of grid energy storage
TS3: Integration and dispatch of grid energy storage
TS4: Policy aspects of grid energy storage

Tuesday 12th June, 8:30 – 9:30 Accenture Lecture Theatre A

Opening Session

Chair: Anjan Bose

Welcome addresses from Local Authorities

Trevor Gaunt, PSCC 2018 Conference President
Professor Andrew J Deeks, President of University College Dublin
Federico Milano, Chair of the PSCC 2018 Local Organising Committee, University College Dublin
Mario Paolone, Technical Committee Programme Chair

Keynote Speaker Dr Ivan Dudurych, Eirgrid

19:00 – 21:30 Zone 1, Ground Floor, O'Brien Centre for Science

Welcome Reception

Wednesday 13th June, 8:30 – 9:30 Moore Auditorium

Survey Paper 1: Stability of transmission systems with low-inertia

Chair: Federico Milano

Foundations and Challenges of Low-Inertia Systems

Federico Milano; Florian Dörfler; Gabriela Hug; David Hill; Gregor Verbic

15:40 - 10:30 Conference Excursion Glendalough and Taylors Three Rock Pub

Thursday 14th June, 8:30 – 9:30 Moore Auditorium

Survey Paper 2: Situational awareness and control of distribution systems and interaction with transmission systems

Chair: Wolfram Wellssow

Situational awareness and control of distribution systems and interaction with transmission systems

Wolfram Wellssow; Robert Brandalik; Marco Weisenstein; Haiyan Ma; Olav Krause; Anne-Katrin Marten; Tomás Gómez; Jose Pablo Chaves; Gregory C. Zweigle; Yong Li

19:00 – 23:00 Round Room, The Mansion House

Conference Gala Dinner

PLENARY AND SPECIAL SESSIONS

Friday 15th June, 12:00 – 13:30 Moore Auditorium

Panel Session: Cybersecurity and cyber-physical power systems

Chair: Anjan Bose

Cyber-Physical System Security of the Power Grid

Chen-Ching Liu

Cyber Security

William Sanders

Physical and Cyber Security Interlinks in the European Power Networks

Sonia Twohig

Cyber Security

Stefan Hoppe

Cyber security on an ageing, evolving power system

David Willacy

```
from cvxopt.dias import geny
from ..device import device
from ..extensionsExtras import (metadata, supdate, massign,
                                supdate, spassign, sdassign,
                                lincos, crimp, polar, cract,
                                lincos, crimp, polar, cract,
                                s0iv, md)
7
8 class common(device):
9     """Core synchronous machine class"""
10    def __init__(self):
11        self.type = 'synchronous'
12        self.category = 'machine', 'Generation', 'Transmission'
13        self.mec_init()
14        self.state.set('omega', 1.0, 'speed', 1.0)
15        self.algeb.set('rpm', 1.0, 'mechanical power', 'pu(M)')
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AT A GLANCE PROGRAMME

Day 1 - Monday 11 June

09:15 - 10:45	Tutorial: Modeling and applications of energy storage systems in power grids - Energy storage fundamentals and modelling
10:45 - 11:00	Coffee Break
11:00 - 12:30	Tutorial: Modeling and applications of energy storage systems in power grids - Stability and control of grid energy storage
12:30 - 14:00	Lunch
14:00 - 15:30	Tutorial: Modeling and applications of energy storage systems in power grids - Integration and dispatch of grid energy storage
15:30 - 15:50	Coffee Break
15:50 - 17:20	Tutorial: Modeling and applications of energy storage systems in power grids - Policy aspects of grid energy storage

Day 2 - Tuesday, 12 June

08:30 - 09:30	Opening Session			
09:30 - 10:00	Coffee Break			
10:00 - 12:00	S01: Distribution network control and optimization	S02: HVDC as part of power systems 1	S03: Power System Economics	S04: Electro-mobility
12:00 - 13:30	Lunch Break			
13:30 - 15:30	S05: Distribution network monitoring, computation and operation	S06: Power System Protection 1	S07: Interaction between DSO and TSO	S08: Power system dynamics 1
15:30 - 16:00	Coffee Break			

AT A GLANCE PROGRAMME

Day 2 - Tuesday, 12 June (Continued)

16:00 - 18:00	S09: Real time operation and control of DER	S10: HVDC as part of power systems 2	S11: Uncertainty and risk management methods	S12: Power system dynamics 2
19:00 - 21:30	Welcome reception			

Day 3 - Wednesday, 13 June

08:30 - 09:30	Survey Paper 1: Stability of transmission systems with low-inertia			
09:30 - 10:00	Coffee Break			
10:00 - 12:00	S13: DER aggregation in markets	S14: Power flow relaxations and	S15: Machine learning for power system planning and operations	S16: Power system dynamics 3
12:00 - 13:30	Lunch Break			
13:30 - 15:30	S17: Modelling the flexibility of DER	S18: Optimal power flow 1	S19: Electro-magnetic transients simulation and modelling	S20: Economic dispatch and unit commitment
15:40 - 22:30	Conference excursion – Glendalough and Taylors			

AT A GLANCE PROGRAMME

Day 4 - Thursday, 14 June				
08:30 - 09:30	Survey Paper 2: Situational awareness and control of distribution systems and interaction with transmission systems			
09:30 - 10:00	Coffee Break			
10:00 - 12:00	S21: Massive integration of renewable energy resources	S22: Modelling of cyber-physical energy and communication systems	S23: Power system modeling and control	S24: Optimal power flow 2
12:00 - 13:30	Lunch Break			
13:30 - 15:30	S25: Distribution system monitoring, operation and optimization	S26: Decentralized coordination and control of DER	S27: Power system reliability and security	S28: Operation planning of hydrothermal power systems
15:30 - 16:00	Coffee Break			
16:00 - 18:00	S29: System resilience and emergency control	S30: Advanced control centre tools	S31: Statistical learning and applications	S32: Power electronics as part of power systems
19:00 - 23:00	Conference gala dinner – Mansion House			

AT A GLANCE PROGRAMME

Day 5 - Friday, 15 June				
08:30 - 09:50	S33: Optimization under uncertainty	S34: Insulation coordination	S35: Power system protection 2	S36: Wind energy systems
09:50 - 10:10	Coffee Break			
10:10 - 11:30	S37: Low inertia power systems	S38: Wide area monitoring and control	S39: Partitioning and clustering in power system calculations	S40: Power Quality
11:30 - 12:00	Coffee Break			
12:00 - 13:30	Panel Session: Cybersecurity and cyber-physical power systems			
13:30 - 13:45	Closing Session			

TECHNICAL PROGRAMME

DAY 1 - MONDAY 11 JUNE 2018

Time	Subject
9:15 - 10:45	<p>Tutorial: Modeling and applications of energy storage systems in power grids - Energy storage fundamentals and modelling (Moore Auditorium)</p> <p>Chair: Ioannis Konstantelos</p> <p>Electrochemical energy storage</p> <p>David Howey</p> <p>Thermal and cryogenic energy storage</p> <p>Yulong Ding</p>
10:45 - 11:00	Coffee Break
11:00 - 12:30	<p>Tutorial: Modeling and applications of energy storage systems in power grids - Stability and control of grid energy storage (Moore Auditorium)</p> <p>David Howey</p> <p>Modelling CAES and flywheel storage systems</p> <p>Claudio Canizares</p> <p>Transient simulation of network battery storage systems</p> <p>Adria Junyent Ferre</p>
12:30 - 14:00	Lunch
14:00 - 15:30	<p>Tutorial: Modeling and applications of energy storage systems in power grids - Integration and dispatch of grid energy storage (Moore Auditorium)</p> <p>Adria Junyent Ferre</p> <p>Dispatch and clustering of ancillary services from distributed storages</p> <p>Fabrizio Sossan</p> <p>Integration of energy storage into unit commitment and electricity markets</p> <p>Damian Flynn</p>

TECHNICAL PROGRAMME

15:30 - 15:50	Coffee Break
15:50 - 17:20	<p>Tutorial: Modeling and applications of energy storage systems in power grids - Policy aspects of grid energy storage (Moore Auditorium)</p> <p>David Howey</p> <p>Economic, environmental and security of supply benefits of storage</p> <p>Ioannis Konstantelos</p> <p>Regulation and integration of energy storage</p> <p>Tomás Gómez</p>

DAY 2 - TUESDAY 12 JUNE 2018

Time	Room: Accenture Theatre A
8:30 - 9:30	<p>Opening Session</p> <p>Chair: Anjan Bose</p> <p>Welcome addresses from Local Authorities</p> <p>Trevor Gaunt, PSCC 2018 Conference President</p> <p>Professor Andrew J Deeks, President of University College Dublin</p> <p>Federico Milano, Chair of the PSCC 2018 Local Organising Committee, University College Dublin</p> <p>Mario Paolone, Technical Committee Programme Chair</p> <p>Keynote Speaker</p>

TECHNICAL PROGRAMME

DAY 2 - TUESDAY 12 JUNE 2018

	Icon Theatre D	Lynch Theatre F
10:00 - 12:00	<p>S01: Distribution network control and optimization Chair: Ian Hiskens</p> <p>Service Restoration in DG-Integrated Distribution Networks Using an Exact Convex OPF Model Hossein Sekhavatmanesh; Mostafa Nick; Mario Paolone; Rachid Cherkaoui</p> <p>Optimal Tap-Operations of a Regulated Distribution Transformer Considering Conservation Voltage Reduction Effects in Active Low-Voltage Grids Leschek Kopczynski; Michael Schallenburg; Philipp Huppertz; Roland Zeise</p> <p>Optimal Tap Selection of Step-Voltage Regulators in Multi-Phase Distribution Networks Mohammadhafez Bazrafshan; Nikolaos Gatsis; Hao Zhu</p> <p>Confidence-level optimization in distribution grids for voltage droop controllers tuning Jérôme Buire; Frédéric Colas; Jean-Yves Dieulot; Leticia De-Alvaro; Xavier Guillaud</p> <p>An Optimal and Distributed Feedback Voltage Control under Limited Reactive Power Guannan Qu; Na Li</p> <p>Hierarchical Predictive Control Algorithms for Optimal Design and Operation of Microgrids Sai Krishna Kanth Hari; Kaarthik Sundar; Harsha Nagarajan; Russell Bent; Scott Backhaus</p>	<p>S02: HVDC as part of power systems 1 Chair: Daniel Molzahn</p> <p>Preventive Parameterization of DC Voltage Control for N-1 security of AC-HVDC-Systems Franz Linke; Florian Sass; Dirk Westerman</p> <p>Optimal Operation of the Western Link Embedded HVDC Connection Aaron Leavy; Waqqas Bukhsh; Keith Bell</p> <p>Optimizing converter control for embedded HVDC power Joost Linthorst; Marjan van den Akker; Gabriel Bloemhof; Cees Plet</p> <p>Steady State Analysis and Control of a MMC HVDC-Link operated in parallel with HVAC-Systems Simon Papenheim; Dejan Potkrajac; Mustafa Kizilcay</p> <p>Coordination of Modular Multilevel Converter based HVDC Terminals for Ancillary Services Abel Assegid Taffese; Elisabetta Tedeschi</p> <p>Unit Commitment Problem with AC Power Flow Constraints for a Hybrid Transmission Grid Mohasha Isuru Sampath Lahanda Purage; Matthias Hotz; Hoay Beng Gooi; Wolfgang Utschick</p>
12:00 - 13:30	Lunch	

TECHNICAL PROGRAMME

DAY 2 - TUESDAY 12 JUNE 2018

George Moore Auditorium	Intel Theatre E
<p>S03: Power System Economics Chair: Anthony Papavasiliou</p> <p>Negotiation Algorithms for Peer-to-Peer Electricity Markets: Computational Properties Fabio Moret; Thomas Baroche; Etienne Sorin; Pierre Pinson</p> <p>A Distributed Economic Dispatch Mechanism to Implement Distribution Locational Marginal Pricing Zhao Yuan; Mohammad Reza Hesamzadeh</p> <p>Offering Strategy of an Aggregator in a Flexibility Balancing Market Using Asymmetric Block Offers Lucien Bobo; Stefanos Delikaraoglou; Niklas Vespermann; Jalal Kazempour; Pierre Pinson</p> <p>Offering strategy of a price-maker PV power plant: multi-stage stochastic programming with probabilistic constraints Xuejiao Han; Evaggelos Kardakos; Gabriela Hug</p> <p>Short/mid-term hydrothermal dispatch and spot pricing for large-scale systems - the case of Brazil André Diniz; Tiago Santos; Renato Cabral; Lilian Santos; Maria Elvira Maceira; Fernanda Costa</p> <p>Stable interconnection of continuous-time price-bidding mechanisms with power network dynamics Tjerk Stegink; Ashish Cherukuri; Claudio De Persis; Arjan van der Schaft; Jorge Cortés</p>	<p>S04: Electro-mobility Chair: Joao A. Pecas Lopes</p> <p>Customer- and Network-Aware Decentralized EV Charging Control Mingxi Liu; Phillippe K. Phanivong; Duncan S. Callaway</p> <p>Response Accuracy and Tracking Errors with Decentralized Control of Commercial V2G Chargers Charalampos Ziras; Antonio Zecchino; Mattia Marinelli</p> <p>A Market Framework for Enabling Electric Vehicles Flexibility Procurement at the Distribution Level Considering Grid Constraints Ana Gadea; Mattia Marinelli; Antonio Zecchino</p> <p>The Impact of Electric Vehicles on Low Voltage Grids: A Case Study of Berlin Mahmoud Draz; Marcus Voß; Daniel Freund; Sahin Albayrak</p> <p>Agent Based Modelling and Simulation of Plug-in Electric Vehicles Adoption in Norway Sondre Flinstad Harbo; Salman Zaferanlouei; Magnus Korpås</p> <p>Impact of Large Fleets of Plug-in-Electric Vehicles on Transmission Systems Expansion Planning Phillipe Gomes; Joao Saraiva; Mario Coelho; Bruno Dias; Leonardo Willer; Antonio Candia</p>

TECHNICAL PROGRAMME

DAY 2 - TUESDAY 12 JUNE 2018

	Icon Theatre D	Lynch Theatre F
13:30 - 15:30	<p>S05: Distribution network monitoring, computation and operation Chair: Rachid Cherkaoui</p> <p>A two-step distribution system state estimator with grid constraints and mixed measurements Miguel Picallo Cruz; Adolfo Anta; Bart De Schutter; Ara Panosyan</p> <p>Multi-Stage Constrained State Identification in Distribution Grids Using Uncertainty Intervals Maximilian Schmidt; Tobias Hess; Peter Schegner</p> <p>Modelling Active Distribution Networks under Uncertainty: Extracting Parameter Sets from Randomized Dynamic Responses Gilles Chaspierre; Patrick Panciatici; Thierry Van Cutsem</p> <p>Transform for Probabilistic Voltage Computation on Distribution Feeders with Distributed Generation Munyaradzi Justice Chihota; Charles Trevor Gaunt</p> <p>Receding-horizon optimization of unbalanced distribution systems with time-scale separation for discrete and continuous control devices Nawaf Nazir; Mads Almassalkhi</p> <p>Distributed Control of Active Distribution Networks for Frequency Support Zhiyuan Tang; Tao Liu; Congchong Zhang; Yu Zheng; David. J. Hill</p>	<p>S06: Power System Protection 1 Chair: Ian Izykowski</p> <p>Combining Transmission Line Protection with Voltage Stability Monitoring Vassilis Nikolaidis; Panagiotis Mandoulidis; Costas Vournas</p> <p>Electromagnetic Time Reversal Applied to Fault Location: On the Properties of Back-Injected Signals Zhaoyang Wang; Reza Razzaghi; Mario Paolone; Farhad Rachidi</p> <p>Fault Location on Distributed and Transmission Lines Based on Traveling Wave Arrival Time Determination Using Resonance Filter Angelika Jezierska; Cezary Dzienis; Yilmaz Yelgin; Hans Eberhardt</p> <p>Local Supervision of Distance Relay using Hodrick Prescott Filter Swati Lavand; Shreevardhan Soman</p> <p>Optimization of First Zone Boundary of Adaptive Distance Protection for Flexible Transmission Lines Nadezhda Davydova; Dmitry Shchetinin; Gabriela Hug</p> <p>Noncommunication Accelerated Sequential Tripping for Remote-End Faults on Transmission Lines Sadegh Azizi; Mingyu Sun; Vladimir Terzija; Marjan Popov</p>
15:30 - 16:00	Coffee Break	

TECHNICAL PROGRAMME

DAY 2 - TUESDAY 12 JUNE 2018

George Moore Auditorium	Intel Theatre E
<p>S07: Interaction between DSO and TSO Chair: Wolfram Wellssow</p> <p>Coordination Schemes for the Integration of Transmission and Distribution System Operations Anthony Papavasiliou; Ilyes Mezghani</p> <p>Modelling of Active Distribution Networks and its Impact on the Performance of Emergency Controls Lena Robitzky; Ulf Haeger; Christian Rehtanz</p> <p>AC OPF-based Methodology for Exploiting Flexibility Provision at TSO/DSO Interface via OLTC-Controlled Demand Reduction Florin Capitanescu</p> <p>Determination of the Time-Dependent Flexibility of Active Distribution Networks to Control Their TSO-DSO Interconnection Power Flow Daniel Mayorga Gonzalez; Jan Hachenberger; Jonas Hinker; Florian Rewald; Ulf Häger; Christian Rehtanz; Johanna Myrzik</p> <p>Allocation of Frequency Control Reserve from Aggregated Resources of Active Distribution Systems Mohsen Kalantar Neyestanaki; Mokhtar Bozorg; Fabrizio Sossan; Rachid Cherkaoui</p> <p>Improved Assessment of the Flexibility Range of Distribution Grids Using Linear Optimization Daniel Contreras; Krzysztof Rudion</p>	<p>S08: Power system dynamics 1 Chair: Glauco Taranto</p> <p>Small-signal Stability Analysis of Power Systems with Inclusion of Periodic Time-Varying Delays Muyang Liu; Federico Milano</p> <p>Systematic Approach for Finding the Linearizable Regions in Dynamic Power System Models Johnny Leung; Michel Kinnaert; Jean-Claude Maun; Fortunato Vilella</p> <p>A State-Space Modeling Framework for Microgrid Small-Signal Stability Analysis Leonardo Rese; Antonio Simões Costa; Aguialdo Silveira e Silva</p> <p>Eigen calculation of Coupling Modes in Large-scale Interconnected Power Systems with High Power Electronics Penetration Mohamed Kouki; Bogdan Marinescu; Florent Xavier</p> <p>A Generic Model for Power Park Modules for Both Transient and Small-signal Stability Analysis Mohamed Belhocine; Bogdan Marinescu; Florent Xavier</p> <p>Power system stability enhancement through the optimal, passivity-based, placement of SVCs Chrysovalantis Spanias; Petros Aristidou; Michalis Michaelides; Ioannis Lestas</p>

TECHNICAL PROGRAMME

DAY 2 - TUESDAY 12 JUNE 2018

	Icon Theatre D	Lynch Theatre F
16:00 - 18:00	S09: Real time operation and control of DER Chair: Johanna Mathieu	S10: HVDC as part of power systems 2 Chair: Xavier Guillaud
	Optimal Ensemble Control of Loads in Distribution Grids with Network Constraints Michael Chertkov; Deepjyoti Deka; Yury Dvorkin	Power-Hardware-In-the-Loop simulation of VSC-HVDC based three-terminal DC mock-up Khaled Almaksour; Samy Akkari; Mohamed Moez Belhaouane; Frederic Colas; Xavier Guillaud
	Domestic Battery and Power-to-Heat Storage for Self-Consumption and Provision of Primary Control Reserve Baptiste Feron; Antonello Monti	Study of Resonance Issues between HVDC link and Power System Components using EMT Simulations Hani Saad; Albane Schwob
	Optimal Operation of Interconnected Home-Microgrids with Flexible Thermal Loads: A Comparison of Decentralized, Centralized, and Hierarchical-distributed Model Predictive Control Diego I. Hidalgo-Rodríguez; Johanna Myrzik	Voltage Source Converter subject to Large Decrease of Short-Circuit Capacity: a Case Study Lampros Papangelis; Marie-Sophie Debry; Thibault Prevost; Patrick Panciatici; Thierry Van Cutsem
	Robustly Maximal Utilisation of Energy-Constrained Distributed Resources Michael Evans; Simon H. Tindemans; David Angeli	The Impact of Modular Multilevel Converter Control on DC Short-Circuit Currents of HVDC Systems Vinicius Lacerda; Nayara Suzuki; Denis Coury; Renato Monaro
	Power Systems Flexibility from District Heating Networks Lesia Mitridati; Joshua Adam Taylor	Task separation for real-time simulation of the CIGRE DC grid benchmark Sebastien Denetiere; Boris Bruned; Hani Saad; Eric Lemieux
	A New Method for Handling Lockout Constraints within Controlled TCL Aggregations Charalampos Ziras; Evangelos Vrettos; Shi You; Henrik W. Bindner	Optimizing HVDC Grid Expansion and Control for Enhancing DC Stability Atousa Elahidoost; Luca Furieri; Elisabetta Tedeschi; Maryam Kamgarpour
19:00 - 21:30	Opening Reception (Ground Floor of Science Building)	

TECHNICAL PROGRAMME

DAY 2 - TUESDAY 12 JUNE 2018

George Moore Auditorium	Intel Theatre E
S11: Uncertainty and risk management methods Chair: Robin Preece	S12: Power system dynamics 2 Chair: Thierry van Cutsem
An enhanced risk-based system development process: a case study from the Belgian transmission network Waqqas Bukhsh; Keith Bell; Arnaud Vergnol; Antoine Weynants; Jonathan Sprooten	Impact on Power System Dynamics of PI Control Limiters of VSC-based Devices Mohammed Ahsan Adib Murad; Federico Milano; Alvaro Ortega
Probabilistic Load Flow Method for Correlated Multimodally Distributed Input Variables Marie-Louise Kloubert; Christian Rehtanz	On Robust Stability Criteria for Nonlinear Voltage Controllers in Electrical Supply Networks Sebastian Kraemer; Andreas Saciak; Jan Winkler; Peter Schegner; Klaus Röbenack
An Ambiguity-Averse Model for Planning the Transmission Grid under Uncertainty on Renewable Distributed Generation David Pozo; Alexandre Street; Alexandre Velloso	Quantification of primary frequency control provision from battery energy storage systems connected to active distribution networks Giacomo Piero Schiapparelli; Emil Namor; Fabrizio Sossan; Stefano Massucco; Mario Paolone
Comparative Ranking of Critical Uncertainties Affecting the Stability of Mixed AC/DC System Rian Fatah Mochamad; Kazi N. Hasan; Robin Preece	Secondary and Tertiary Voltage Regulation Controls Based on Regional Optimal Power Flows Blanca Hernandez; Claudio Canizares; Juan Ramirez; Bo Hu; Mingbo Liu
Trading off robustness and performance in receding horizon control with uncertain energy resources Mahraz Amini; Mads Almassalkhi	Impact of distributed generation's fault ride through strategies on transient stability in the transmission grid Janek Massmann; Philipp Erlinghagen; Armin Schnettler
Assessing Risk from Cascading Blackouts given Correlated Component Failures Laurence A. Clarfeld; Margaret J. Eppstein; Paul D.H. Hines	Frequency Stability in Island Networks: Development of Kaplan Turbine Model and Control of Dynamics Michael Gratza; Rolf Witzmann; Christoph J. Steinhart; Michael Finkel; Thomas Nagel; Martin Becker; Tobias Wopperer; Helmut Wackerl

TECHNICAL PROGRAMME

DAY 3 - WEDNESDAY 13 JUNE 2018

George Moore Auditorium	
8:30 - 9:30	<p>Survey Paper 1: Stability of transmission systems with low-inertia Chair: Federico Milano</p> <p>Foundations and Challenges of Low-Inertia Systems Federico Milano; Florian Dörfler; Gabriela Hug; David Hill; Gregor Verbic</p>
9:30 - 10:00	Coffee Break
Icon Theatre D	Lynch Theatre F
10:00 - 12:00	<p>S13: DER aggregation in markets Chair: Yannick Phulpin</p> <p>On Controllability of Demand Response Resources & Aggregators' Bidding Strategies Kenneth Bruninx; Hrvoje Pandzic; Erik Delarue</p> <p>Multi-Objective Portfolio Optimization of Electricity Markets Participation Ricardo Faia; Tiago Pinto; Zita Vale; Juan Manuel Corchado</p> <p>Constructing Prosumer Coalitions for Energy Cost Savings Using Cooperative Game Theory Liyang Han; Thomas Morstyn; Malcolm McCulloch</p> <p>Investigating the impact of demand flexibility on electricity retailers Dawei Qiu; Yujian Ye; Dimitrios Papadaskalopoulos; Goran Strbac</p> <p>The flexibility of thermostatically controlled loads as a function of price notice time Lars Herre; Johanna L. Mathieu; Lennart Söder</p> <p>Coordinated Scheduling of Demand Response Aggregators and Customers in an Uncertain Environment Saber Talari; Miadreza Shafie-khah; Fei Wang; João Catalão</p>
	<p>S14: Power flow relaxations and approximations Chair: Steven Low</p> <p>Strengthening QC Relaxations of OPF Problems via Constraints on Voltage Magnitude Differences Mohammad Rasoul Narimani; Daniel Molzahn; Mariesa Crow</p> <p>Tight Piecewise Convex Relaxations for Global Optimization of Optimal Power Flow Mowen Lu; Harsha Nagarajan; Russell Bent; Sandra D. Eksioglu; Scott J. Mason</p> <p>Optimal Adaptive Linearizations of the AC Power Flow Equations Krishnamurthy Dvijotham; Sidhant Misra; Daniel K. Molzahn</p> <p>Multiphase Optimal and Non-Singular Power Flow by Successive Linear Approximations Andrey Bernstein; Cong Wang; Jean-Yves Le Boudec</p> <p>Robust Convergence of Power Flow using Tx Stepping Method with Equivalent Circuit Formulation Amritanshu Pandey; Marko Jereminov; Martin Wagner; Gabriela Hug; Larry Pileggi</p> <p>PowerModels.jl: An Open-Source Framework for Exploring Power Flow Formulations Carleton Coffrin; Russell Bent; Kaarthik Sundar; Yeesian Ng; Miles Lubin</p>
George Moore Auditorium	Intel Theatre E
<p>S15: Machine learning for power system planning and operations Chair: Antonio Simoes Costa</p> <p>An Unsupervised Deep Learning Approach for Scenario Forecasts Yize Chen; Xiyu Wang; Baosen Zhang</p> <p>Risk-based security assessment with big data driven probabilistic modeling for wet snow extreme events Emanuele Ciapessoni; Diego Cirio; Pietro Marcacci; Andrea Pitto; Marino Sforna</p> <p>Selecting and Evaluating Representative Days for Generation Expansion Planning Abeer Almainouni; Atinuke Ademola-Idowu; J. Nathan Kutz; Ahlmahz Negash; Daniel Kirschen</p> <p>Big Data and Deep Learning Platform for Tera-byte-Scale Renewable Datasets Yang Weng; Abhishek Kumar; Muhammad Saleem; Baosen Zhang</p> <p>A Machine Learning Method Creating Network Models Based on Measurements Martin Nilsson; Lennart Söder; Jon Olafsson; Lars Nordström; Robert Eriksson; Göran Ericsson</p> <p>Using Machine Learning to Enable Probabilistic Reliability Assessment in Operation Planning Laurine Duchesne; Efthymios Karangelos; Louis Wehenkel</p>	<p>S16: Power system dynamics 3 Chair: Florin Capitanescu</p> <p>Stability Assessment of Power Systems Based on a Robust Sum-Of-Squares Optimization Approach Lester Kalemba; Morten Hovd; Kjetil Uhlen</p> <p>Rotor Angle Stability Analysis using Normal Form Method with High Penetrations of Renewable Energy Sources Hiroyuki Amano; Akihiko Yokoyama</p> <p>Power System Transient Stability Analysis Using Sum Of Squares Programming Matteo Tacchi; Bogdan Marinescu; Marian Anghel; Soumya Kundu; Sifeddine Benahmed; Carmen Cardozo</p> <p>Transient Stability Analysis using Shifted Frequency Analysis (SFA) Andrea Marti; Juri Jatskevich</p> <p>Preventive-Corrective Demand Response to Improve Short-Term Voltage Stability and Transient Stability in Power Systems Rizhong Kang; Yan Xu; Zhao Yang Dong; David John Hill</p> <p>Impact of Plant Level Voltage Control by Large-Scale Inverter Based Generators on Long-Term Voltage Stability Luis David Pabon Ospina; Andres Felipe Correa; Maria Valov; Gustav Lammert; Daniel Premm</p>

TECHNICAL PROGRAMME

DAY 3 - WEDNESDAY 13 JUNE 2018

TECHNICAL PROGRAMME

DAY 3 - WEDNESDAY 13 JUNE 2018

12:00 - 13:30	Lunch				
	Icon Theatre D	Lynch Theatre F		George Moore Auditorium	
13:30 - 15:30	<p>S17: Modelling the flexibility of DER Chair: Keith Bell</p> <p>Modelling Aspects of Flexible Multi-Energy Microgrids Ninoslav Holjevac; Tomislav Capuder; Ning Zgang; Igor Kuzle; Chongqing Kang</p> <p>Multiphysics modelling of asynchronously-connected grids Giovanni De Carne; Marco Liserre; Boqi Xie; Chiyang Zhong; Sakis A. P. Meliopoulos; Costas Vournas</p> <p>Aggregated Dynamic Equivalent of a Distribution System hosting Inverter-based Generators Gilles Chaspierre; Patrick Panciatici; Thierry Van Cutsem</p> <p>Equivalent Energy Storage Capability of Combined Heat Pump and Biogas Engine Generator System Ryoichi Hara; Hiroyuki Kita; Shiho Ishikawa</p> <p>Approximating Flexibility in Distributed Energy Resources: A Geometric Approach Soumya Kundu; Karanjit Kalsi; Scott Backhaus</p> <p>System Properties of Packetized Energy Management for Aggregated Diverse Resources Luis Duffaut Espinosa; Mads Almas-salkhi; Paul Hines; Jeff Frolik</p>	<p>S18: Optimal power flow 1 Chair: Line Roald</p> <p>Data-driven Security-Constrained AC-OPF for Operations and Markets Lejla Halilbasic; Florian Thams; Andreas Venzke ; Spyros Chatzivasileiadis; Pierre Pinson</p> <p>Distributionally Robust Chance-Constrained Optimal Power Flow Assuming Log-Concave Distribution Bowen Li; Ruiwei Jiang; Johanna Mathieu</p> <p>Towards an AC Optimal Power Flow Algorithm with Robust Feasibility Guarantees Daniel Molzahn; Line Roald</p> <p>Variance-aware optimal power flow Daniel Bienstock; Apurv Shukla</p> <p>Convex Relaxations of Security Constrained AC Optimal Power Flow under Uncertainty Andreas Venzke; Spyros Chatzivasileiadis</p> <p>The Price of Uncertainty: Chance-constrained OPF vs. In-hindsight OPF Tillmann Muehlpfordt; Veit Hagenmeyer; Timm Faulwasser</p>		<p>S19: Electro-magnetic transients simulation and modelling Chair: Taku Noda</p> <p>A Dynamic-Phasor Simulation Method with Sparse Tableau Formulation for Distribution System Analysis: A Preliminary Result Taku Noda; Toshiaki Kikuma; Tomohiro Nagashima; Rikido Yonezawa</p> <p>A Comparison of Numerical Integration methods and Discontinuity Treatment for EMT Simulations Xiaopeng Fu; Serigne Mouhamadou Seye; Jean Mahseredjian; Ming Cai; Christian Dufour</p> <p>Transient Simulation Based Model Identification of a Black Boxed LCC HVDC Prashant Agnihotri; Mukesh Kumar Das; Aniruddha Madhukar Gole; Dharshana Muthumuni; Bathiya Jayasekara</p> <p>Evaluation of FDTD model for transient studies with complicated cable configurations Fani Barakou; H.M. Jeewantha De Silva; Peter A.A.F. Wouters; E. Fred Steennis</p> <p>Underground cable systems ground return sensitivity to soil inaccuracies João Pedro Salvador; Antonio Carlos Lima; Maria Teresa Correia de Barros</p> <p>Computation of Overhead Line / Underground Cable Parameters with Improved MoM-So Method Haoyan Xue; Akihiro Ametani; Jean Mahseredjian; Ilhan Kocar</p>	<p>Intel Theatre E</p> <p>S20: Economic dispatch and unit commitment Frequency response constrained economic dispatch with consideration of generation contingency size Chair: Sebastián Püschel-Løvengreen ; Pierluigi Mancarella</p> <p>MIQP-Based Algorithm for the Global Solution of Economic Dispatch Problems with Valve-Point Effects Pierre-Antoine Absil; Benoît Sluysmans; Nicolas Stevens</p> <p>Day-ahead stochastic scheduling model considering market transactions in smart grids João Soares; Fernando Lezama; Bruno Canizes; Mohammed Ali Ghazvini Fotouhi; Zita Vale; Tiago Pinto</p> <p>Real-time Dynamic Economic Load Dispatch Considering Prediction Errors of PV Yutaka Sasaki; Naoto Yorino; Yoshifumi Zoka; Adelhard Rehiara Beni</p> <p>An Asynchronous Decomposition Algorithm for Security Constrained Unit Commitment under Contingency Events Kibaek Kim; Víctor Zavala; Mihai Anitescu</p> <p>Gas and Electric Grid Unit Commitment with Coordinated N-1 Generator Contingency Analysis Mahdi Jamei; Eran Schweitzer; Anna Scaglione; Kory Hedman</p>
15:40 - 22:30	Conference excursion – Glendalough and Taylors (UCD Bus Parking Space)				

TECHNICAL PROGRAMME

DAY 3 - WEDNESDAY 13 JUNE 2018

TECHNICAL PROGRAMME

DAY 4 – THURSDAY 14 JUNE 2018

George Moore Auditorium	
8:30 - 9:30	<p>Survey Paper 2: Situational awareness and control of distribution systems and interaction with transmission Chair: Wolfram Wellssow</p> <p>Situational awareness and control of distribution systems and interaction with transmission systems Wolfram Wellssow; Robert Brandalik; Marco Weisenstein; Haiyan Ma; Olav Krause; Anne-Katrin Marten; Tomás Gómez; Jose Pablo Chaves; Gregory C. Zweigle; Yong Li</p>
9:30 - 10:00	Coffee Break
Icon Theatre D	Lynch Theatre F
10:00 - 12:00	<p>S21: Massive integration of renewable energy resources Chair: Andrew Keane</p> <p>S22: Modelling of cyber-physical energy and communication systems Chair: Lars Nordstrom</p> <p>Model Predictive Control for Co-operative Energy Management at City-District Level Ivelina Stoyanova; Imen Jendoubi; Antonello Monti</p> <p>A Hybrid Simulation Tool for Distributed Generation Integration Studies Thainan Santos Theodoro; Marcelo Aroca Tomim; Pedro Gomes Barbosa; Antonio Antonio Carlos Siqueira de Lima</p> <p>Improving PV Hosting Capacity of Distribution Grids Considering Dynamic Voltage Characteristic Poria Hasanpor Divshali; Lennart Söder</p> <p>Cyber Network Design for Secondary Frequency Regulation: A Spectral Approach Linqi Guo; Changhong Zhao; Steven Low</p> <p>Hosting Capacity Improvement Unlocked by Control Strategies for Photovoltaic and Battery Storage Systems Jan Dinkelbach; Markus Mirz; Tim Schlösser; Antonello Monti</p> <p>Adaptive Cyber-Security Scheme Incorporating QoS Requirements for WAMC Applications Yiming Wu; Yujue Wang; Carl Hauser; Lars Nordström</p> <p>A Linear Multi-Objective Operation Model for Smart Distribution Systems Coordinating Tap-Changers, Photovoltaics and Battery Energy Storage Naser Hashemipour; Taher Niknam; Jamshid Aghaei; Hossein Farahmand; Magnus Korpås; Miadreza Shafie-khah; Gerardo J. Osório; João P. S. Catalão</p> <p>Design and Experimental Validation of an LTE-based Synchrophasor Network in a Medium Voltage Distribution Grid Asja Derviskadic; Paolo Romano; Chang Ge; Wei Koong Chai; Chris Develder; Lorenzo Zanni; Marco Pignati; Mario Paolone</p> <p>Annual Evaluation of Supply-Demand with BESS Charging/Discharging Schedule and UC Updating Based on Intraday Forecasted PV Power Outputs Taisuke Masuta; Daiki Kobayashi; Viet Nguyen Hoang; Hideaki Ohtake</p> <p>Power systems simulation using ontologies to enable the interoperability of multi-agent systems Gabriel Santos; Tiago Pinto; Francisco Silva; Brigida Teixeira; Isabel Praça; Zita Vale</p>
George Moore Auditorium	Intel Theatre E
<p>S23: Power system modeling and control Chair: Alvaro Ortega Manjavacas</p> <p>Load model identification using portable PMUs: a case study in the Omani transmission system Hisham Al Riyami; Musabah Al Siyabi; Dalibor Brnobic; Olivier Antoine; Romani Fahmi; Pierre Jozsz; Karim Karoui</p> <p>A Feature-Based Diagnosis Framework for Power Plant Model Validation Meng Wu; Le Xie</p> <p>Towards Operational Validation: Mapping Power System Inputs to Operating Conditions Eran Schweitzer; Ti Xu; Adam Birchield; Anna Scaglione; Thomas Overbye; Robert Thomas; Zhifang Wang</p> <p>Direct Model Predictive Control: A Theoretical and Numerical Analysis Marie-Liesse Cauwet; Jérémie Decock; Jialin Liu; Olivier Teytaud</p> <p>Online Learning of Power Transmission Dynamics Andrey Lokhov; Marc Vuffray; Dmitry Shemetov; Deepjyoti Deka; Michael Chertkov</p>	<p>S24: Optimal power flow 2 Chair: Alberto Borghetti</p> <p>Statistical Learning for DC Optimal Power Flow Yee Sian Ng; Sidhant Misra; Line Roald; Scott Backhaus</p> <p>Toward Multiperiod AC-Based Contingency Constrained Optimal Power Flow at Large Scale Michel Schanen; Francois Gilbert; Cosmin Gheorghita Petra; Mihai Anitescu</p> <p>Large-Scale Dynamic Optimal Power Flow Problems with Energy Storage Systems Nico Meyer-Huebner; Abolfazl Mosaddegh; Michael Suriyah; Thomas Leibfried; Claudio A. Canizares; Kankar Bhattacharya</p> <p>Dynamic Optimal Power Flow with Storage Restrictions Using Augmented Lagrangian Algorithm Manuel Ruppert; Viktor Slednev; Armin Ardone; Wolf Fichtner</p> <p>Optimal Power Flow Based on Genetic Algorithms and Clustering Techniques Stefan Stankovic; Lennart Söder</p>

TECHNICAL PROGRAMME

DAY 4 – THURSDAY 14 JUNE 2018

TECHNICAL PROGRAMME

DAY 4 – THURSDAY 14 JUNE 2018

	Icon Theatre D	Lynch Theatre F
10:00 - 12:00	A Multi-Objective Method to Design Demand Response Strategies for Power Systems including Wind Power Generation Miadreza Shafie-khah; Marta Ribeiro; Neda Hajibandeh; Gerardo Osório; João Catalão	Considering Time Correlation in the Estimation of Privacy Loss for Consumers with Smart Meters Jun-Xing Chin; Giulio Giaconi; Tomas Tinoco De Rubira; Deniz Gündüz; Gabriela Hug
12:00 - 13:30	Lunch	
13:30 - 15:30	S25: Distribution system monitoring, operation and optimization Chair: Carlo Alberto Nucci	S26: Decentralized coordination and control of DER Chair: Mario Paolone
	Probabilistic Low Voltage State Estimation using Analog-Search Techniques Gil Sampaio; Ricardo Bessa; Jorge Pereira; Vladimiro Miranda	Usage of blockchain for peer-to-peer energy exchanges: design, simulation and recommendations David Vangulick; Bertrand Cornélusse; Damien Ernst
	Co-optimization of a Multi-Energy Microgrid Considering Multiple Services Han Wang; Nicholas Good; Eduardo Alejandro Martínez Ceseña; Pierluigi Mancarella	An ADMM-based Coordination and Control Strategy for PV and Storage to Dispatch Stochastic Prosumers: Theory and Experimental Validation Rahul Kumar Gupta; Fabrizio Sossan; Enrica Scolari; Emil Namor; Luca Fabietti; Colin N. Jones; Mario Paolone
	The role of fault-ride-through capability of distributed energy storage for the mitigation of voltage sags in Low Voltage distribution grids Justino Rodrigues; António Lopes; Clara Gouveia; Luis Miranda; Carlos Moreira; João Peças Lopes	Chance-Constrained ADMM Approach for Decentralized Control of Distributed Energy Resources Yury Dvorkin; Michael Chertkov; Ali Hassan; Deepjyoti Deka
	Loss Induced Maximum Power Transfer in Distribution Networks Matthew Deakin; Thomas Morstyn; Dimitra Apostolopoulou; Malcolm McCulloch	Advanced Energy Management for Demand Response and Microgeneration Integration Cláudia Abreu; David Rua; Paulo Machado; João Peças Lopes; Miguel Heleno
	Unlocking CVR Benefits Using Active Voltage Control in LV Networks Luis Gutierrez-Lagos; Andreas Procopiou; Luis Ochoa	Self Scheduling of a Virtual Power Plant in Energy and Reserve Electricity Markets: A Stochastic Adaptive Robust Optimization Approach Ana Baringo; Luis Baringo; José M. Arroyo
	Load Model Parameter Estimation by Transmission-Distribution Co-Simulation Shirang Abhyankar; Karthikeyan Balasubramaniam; Bo Cui	Multi-objective probabilistic power resources planning for microgrids with ancillary services capacity Sergio Felipe Contreras; Camilo Andres Cortes; Johanna M.A Myrzik
15:30 - 16:00	Coffee Break	

TECHNICAL PROGRAMME

DAY 4 – THURSDAY 14 JUNE 2018

George Moore Auditorium	Intel Theatre E
Application of Model Predictive Control Algorithm on a Hydro Turbine Governor Control Mateo Beus; Hrvoje Pandžić	Scalable Decomposition Methods for Preventive Security-Constrained Optimal Power Flow Brian Dandurand; Kibaek Kim
S27: Power system reliability and security Chair: Pierluigi Mancarella	S28: Operation planning of hydrothermal power systems Chair: Ricardo Bessa
A Model to Evaluate the Regulatory Reliability Indexes Impact on the Subtransmission and Distribution Network Expansion Planning João Daniel Andrade Cascalho; Pablo Cuervo	Continuous Time Multi-stage Stochastic Reserve and Unit Commitment Kari Hreinsson; Bitá Analui; Anna Scaglione
Modeling of Smart Grid Technologies for Reliability Calculations of Distribution Grids Kristof Kamps; Fabian Möhrke; Markus Zdrallek; Philipp Awater; Michael Schwan	Twenty Years of Application of Stochastic Dual Dynamic Programming in Official and Agent Studies in Brazil – Main Features and Improvements on the Newave Model Maria Elvira Maceira; Debora Penna; Andre Diniz; Cesar Vasconcellos; Roberto Pinto; Cristiane Cruz; Albert Melo
Optimal Allocation of Maneuver Devices in Distribution Networks for Reliability Improvement Antônio Candiá Junior; Leonardo Oliveira; Bruno Dias; Edimar Oliveira; Phillipe Gomes; Mário Coelho; João Saraiva	A Probabilistic Approach to Define the Amount of Energy to be Traded in Hydro Dominated Interconnected Systems Maria Elvira Maceira; F.R.S. Batista; A.C.G. Melo; L.F.E.C. Silva; R. Olasagasti; L.G.B. Marzano
Security Assessment in Gas-Electric Networks Conor O'Malley; Line Roald; Gabriela Hug; Drosos Kourounis; Olaf Schenk	Operational Hydropower Simulation in Cascaded River Systems for Intraday Re-Planning Hans Ivar Skjelbred; Jiehong Kong
A Power-Balanced Clustering Algorithm to Improve Electrical Infrastructure Resiliency Chen Huo; Eduardo Cotilla-Sanchez	Accelerating Dual Dynamic Programming for Stochastic Hydrothermal Coordination Problems Lilian Chaves Brandao; André Luiz Diniz; Luidi Simonetti
Topological Graph Metrics for Detecting Grid Anomalies and Improving Algorithms Jonas Kersulis; Ian Hiskens; Carleton Coffrin; Daniel Molzahn	Unit Commitment using Nearest Neighbor as a Short-Term Proxy Gal Dalal; Elad Gilboa; Shie Mannor; Louis Wehenkel

TECHNICAL PROGRAMME

DAY 4 – THURSDAY 14 JUNE 2018

	Icon Theatre D	Lynch Theatre F
16:00 - 18:00	<p>S29: System resilience and emergency control Chair: Costas Vournas</p> <p>Establishing Multidimensional Transient Stability Boundaries for Power Systems with Uncertainties Amirhossein Sajadi; Robin Preece; Jovica Milanovic</p> <p>Security-constrained redispatching to enhance power system resilience in case of "wet snow" events Emanuele Ciapessoni; Diego Cirio; Andrea Pitto; Maria Vittoria Cazzol; Matteo Lacavalla; Marino Sfora</p> <p>Storage Scheduling with Stochastic Uncertainties: Feasibility and Cost of Imbalances Riccardo Remo Appino; Jorge Ángel González Ordiano; Ralf Mikut; Timm Faulwasser; Veit Hagenmeyer</p> <p>Numerical Computation of Critical Parameter Values for Fault Recovery in Power Systems Michael Fisher; Ian Hiskens</p> <p>Slack Selection for Unintentional Islanding: Practical Validation in a Benchmark Microgrid Lorenzo Reyes-Chamorro; Wajeb Saab; Roman Rudnik; Andreas Martin Kettner; Mario Paolone; Jean-Yves Le Boudec</p> <p>Evaluation of Factorization methods for Thevenin Equivalent Computations in Real-Time Stability Assessment Christina Hildebrandt; Bahtiyar Can Karatas; Jakob Glarbo Møller; Hjörtur Jóhannsson</p>	<p>S30: Advanced control centre tools Chair: Patrick Panciatici</p> <p>Identifying Plausible Harmful N-k Contingencies: A Practical Approach based on Dynamic Simulations Tilman Weckesser; Thierry Van Cutsem</p> <p>Prediction of Umbrella Constraints Ali Jahanbani Ardakani; Francois Bouffard</p> <p>Exact Topology and Parameter Estimation in Distribution Grids with Minimal Observability Sejun Park; Deepjyoti Deka; Michael Chertkov</p> <p>A computationally efficient State Estimation algorithm for the Supervision of Low Voltage Grids Robert Brandalik; Daniel Henschel; Wolfram H. Wellssow</p> <p>A Centralised Control Method for Tackling Unbalances in Active Distribution Grids Stavros Karagiannopoulos; Petros Aristidou; Gabriela Hug</p> <p>Decentralized Control System for Participation of Plug-in Electric Vehicles in the Load Frequency Control of a Microgrid Ebrahim Rokrok; Miadreza Shafie-khah; Pierluigi Siano; João Catalão</p>
19:00 - 23:00	Conference Gala Dinner (Round Room, Mansion House)	

TECHNICAL PROGRAMME

DAY 4 – THURSDAY 14 JUNE 2018

George Moore Auditorium	Intel Theatre E
<p>S31: Statistical learning and applications Chair: Pierre Pinson</p> <p>Unsupervised Classification for Non-Technical Loss Detection George Messinis; Nikos Hatzigiorgiou</p> <p>Generating Stochastic Residential Load Profiles from Smart Meter Data for an Optimal Power Matching at an Aggregate Level Thierry Zufferey; Gabriela Hug; Andreas Ulbig; Damiano Toffanin; Diren Toprak</p> <p>Assessment of Explanatory Variables on the Failure Rate of Circuit Breakers Using the Proportional Hazard Model Jan Henning Jürgensen; Lars Nordström; Patrik Hilber; Elin Andreasson; Anna Lilly Brodersson</p> <p>Phase Identification of Smart Meters by Clustering Voltage Measurements Frédéric Olivier; Antonio Sutura; Pierre Geurts; Raphaël Fonteneau; Damien Ernst</p> <p>Statistical Representation of EV Charging: Real Data Analysis and Applications Jairo Quirós-Tortós; Alejandro Navarro-Espinosa; Luis F. Ochoa; Timothy Butler</p> <p>Numerical Analysis of the National Travel Survey to Assess the Impact of UK Fleet Electrification Constance Crozier; Dimitra Apostolopoulou; Malcolm McCulloch</p>	<p>S32: Power electronics as part of power systems Chair: Pascal Van Hentenryck</p> <p>Enforcing Strict Current Control in Controlled Voltage Source Converter Model for use in Large Scale Positive Sequence Time Domain Simulations Deepak Ramasubramanian; Vijay Vittal; Evangelos Farantatos</p> <p>Simplified model of droop-controlled MTDC grid – Influence of MMC energy management on DC system dynamics Julian Freytes; Francois Gruson; Frederic Colas; Pierre Rault; Hani Saad; Xavier Guillaud</p> <p>Stability Analysis of All Inverter Interfaced Generation Systems Wenting Yi; David J. Hill</p> <p>Modelling, Simulation and Hardware-in-the-Loop of Virtual Synchronous Generator Control in Low Inertia Power System Junru Chen; Muyang Liu; Cathal O'loughlin; Federico Milano; Terence Odonnell</p> <p>Tuning of cascaded controllers for robust grid-forming Voltage Source Converter Taoufik QORIA; François GRUSON; Xavier Guillaud</p> <p>Phase Segregated Soft Calibration of Instrument Transformers using Synchronised Phasor Measurements Hemantkumar Goklani; Gopal Gajjar; S. A. Soman</p>

TECHNICAL PROGRAMME

DAY 5 – FRIDAY 15TH JUNE 2018

	Icon Theatre D	Lynch Theatre F
08:30 - 9:50	S33: Optimization under uncertainty Chair: Gabriela Hug	S34: Insulation coordination Chair: Maria Teresa Correia de Barros
	Accelerated Methods for the SOCP-Relaxed Component-Based Distributed Optimal Power Flow Sleiman Mhanna; Gregor Verbic; Archie Chapman	Analysis of Lightning Surge Effects on Small-scale Rooftop Photovoltaic Systems Ishan Holland; Wesley Doorsamy; Ken Nixon
	Optimal Management of Storage for Offsetting Solar Power Uncertainty using Multistage Stochastic Programming Taku Kaneda; Bruno Losseau; Anthony Papavasiliou; Damien Scieur; Léopold Cambier; Pierre Henneaux; Niels Leemput	Determination of Transient Overvoltages in a Bipolar MMC-HVDC Link with Metallic Return Max Goertz; Simon Wenig; Michael Suriyah; Thomas Leibfried
	A Coordinate-Descent Algorithm for Tracking Solutions in Time-Varying Optimal Power Flows Jie Liu; Jakub Marecek; Andrea Simonetto; Martin Takac	Lightning Insulation Coordination Study in a 500 kV Air-Insulated Substation – A Comparison Analysis Considering Two Commonly Used Modeling Approaches André Luiz Pereira da Cruz; Washington Araújo Neves
	An efficient method to take into account forecast uncertainties in large scale Probabilistic Power Flow Emanuele Ciapessoni; Diego Cirio; Andrea Pitto; Stefano Massucco; Federico Silvestro	Investigation of very fast-front transient overvoltages for selection and placement of surge arresters Renato Oliveira; Pitshou Bokoro; Wesley Doorsamy
9:50 - 10:10	Coffee Break	
10:10 - 11:30	S37: Low inertia power systems Chair: Federico Silvestro	S38: Wide area monitoring and control Chair: Christian Rehtanz
	Synchronous frequency grid dynamics in the presence of a large-scale population of photovoltaic panels Andrea Peruffo; Emeline Guiu; Alessandro Abate; Patrick Panciatici	Applications of Trend-filtering to Bulk PMU Time-series Data for Wide-area Operator Awareness Aditya Nadkarni; S.A. Soman

TECHNICAL PROGRAMME

DAY 5 – FRIDAY 15TH JUNE 2018

George Moore Auditorium	Intel Theatre E
S35: Power system protection 2 Chair: Peter Schegner	S36: Wind energy systems Chair: Nicolaos Cutululis
Co-Simulation for the Evaluation of IEC 61850 based Protection Schemes André dos Santos; Bruno Soares; Fan Chen; Martijn Kuipers; Sérgio Sabino; António Grilo; Paulo Pereira; Mário Nunes; Augusto Casaca	Continuous-time ARMA Models for Data-based Wind Speed Models Gudrun Margret Jonsdottir; Brendan Hayes; Federico Milano
Comparison of the performance of different directional polarizing methods in cross country fault protection of a MV Loop Alberto Borgnino; Manuel Castillo	Loss reduction in a windfarm participating in primary voltage control using an extension of the Convex DistFlow OPF Benoît Martin; Philippe De Rúa; Emmanuel De Jaeger; François Glineur
A Voltage Based High Impedance Fault Detection Scheme for Distribution Feeders Using Park and Wavelet Transform Miguel Moreto; Igor Kursancew Khairalla	An Anomaly Detection Approach Using Wavelet Transform and Artificial Neural Networks for Condition Monitoring of Wind Turbines' Gearboxes Yue Cui; Pramod Bangalore; Lina Bertling Tjernberg
Resonance Phenomena and DC Fault Handling during Intersystem Faults in Hybrid AC/DC Transmission Systems with Partial DC Cabling Philipp Ruffing; Cora Petino; Sven Rüberg; Jose Alfredo Campos Garcia; Simon Beckler; Akos Arnold	The Influence of Grounding Configuration in a Full Conversion Wind Generator Under Internal Faults Rodrigo Pavanello Bataglioli; Renato Machado Monaco; Vinicius Albernaz Lacerda Freitas; Denis Vinicius Coury
S39: Partitioning and clustering in power system calculations Chair: Damien Ernst	S40: Power Quality Chair: Johanna Myrzik
Transmission Network Reduction Method using Nonlinear Optimization Philipp Fortenbacher; Turhan Demiray; Christian Schaffner	Impact of network conditions on the harmonic performance of PV inverters Sergey Yanchenko; Jan Meyer

TECHNICAL PROGRAMME

DAY 5 – FRIDAY 15TH JUNE 2018

	Icon Theatre D	Lynch Theatre F
10:10 - 11:30	Decentralized Periodic Event-Triggered Frequency Regulation for Multi-Area Power Systems Luwei Yang; Tao Liu; David John Hill	An Evaluation of Algorithms for Synchrophasor Missing Data Recovery Genevieve de Mijolla; Pengzhi Gao; Meng Wang; Joe Chow
	Kinetic Energy Estimation in the Nordic System Mattias Persson; Peiyuan Chen	Design of a Wide-Area Damping Controller Considering Communication Time Delays Yusuke Shiozaki; Nobuyuki Yamaguchi; Tomonori Sadamoto
	A Practical Comparison of Two Algorithms for Inverter Control with Virtual Inertia Emulation Daniel Barbosa; João Ramos; Justino Rodrigues; António Lopes; Rui Esteves Araújo	Frequency Band Decomposition of a Dynamic Persistence Measure Using Ambient Synchrophasor Data Sandip Roy; Bernard Lesieutre
11:30 - 12:00	Coffee Break	
12:00 - 13:30	Panel Session: Cybersecurity and cyber-physical power systems (George Moore Auditorium) Anjan Bose Cyber-Physical System Security of the Power Grid Chen-Ching Liu Cyber Security William Sanders Physical and Cyber Security Interlinks in the European Power Networks Alina Neagu Cyber Security Stefan Hoppe Cyber security on an ageing, evolving power system David Willacy	
13:30 - 13:45	Closing Session (George Moore Auditorium) Chair: Anjan Bose	

TECHNICAL PROGRAMME

DAY 5 – FRIDAY 15TH JUNE 2018

George Moore Auditorium	Intel Theatre E
Disaggregation for Networked Power Systems James Anderson; Fengyu Zhou; Steven Low	Modelling and Aggregation of LED Lamps for Network Harmonic Analysis Xiao Xu; Jagadeesh Gunda; Duo Fang
Spectral MST-based Graph Outlier Detection with Application to Clustering of Power Networks Ilya Tyuryukanov; Marjan Popov; Mart A.M.M. van der Meijden; Vladimir Terzija	The Importance of Realistic Load Modeling in Power System Harmonic Resonance Analysis Atte Pihkala; Pirjo Heine; Bruno Sousa
Hierarchical Programming for Worst-Case Analysis of Power Grids Hatim Djelassi; Stéphane Fliscounakis; Patrick Panciatici; Alexander Mitsos	Model of an Induction Machine with Slot Harmonics for Real-Time Simulation Robert Dimitrovski; Matthias Luther

CONFERENCE INFORMATION

Conference Date and Venue

June 11 - 15, 2018

O'Brien Centre for Science
University College Dublin (UCD)
Belfield, Dublin 4
Ireland

GPS: 53.30828 N | Longitude: -6.223724

Email: psc2018@ucd.ie

Web: www.psc2018.net

The venue is located on the main UCD campus at Belfield, Dublin 4 around 5km south of the city centre. All sessions will be held in the O'Brien Centre for Science.

Language

The official language of the conference is English. There will be no simultaneous interpreting.

Papers

Each registered participant will receive a USB-stick including all the papers presented during the technical sessions.

Name Badges

Participant Name Badges will be provided at the registration desk. All participants are required to wear the badge throughout the conference. Only badge holders will be admitted to the sessions.

Registration

The registration desk will be located in the O'Brien Centre for Science and will be open during the following hours:

Monday 11th June	08:00 – 18:00
Tuesday 12th June	08:00 – 18:00
Wednesday 13th June	09:00 – 15:30
Thursday 14th June	09:00 – 18:00
Friday 15th June	09:00 – 15:00

All practical information will be available at the registration desk.

Internet

Wireless internet access is available across the whole campus. The name of the network is "UCD Wireless" and no password is required. Internet access via "eduroam" service is also available.

Presentations

The session rooms are equipped with a Microsoft Windows operated computer with PowerPoint, Word and Adobe Reader software. Speakers are kindly requested to hand in their presentation on a USB stick, no later than the break prior to their session. This should be done in the session room where the presentation will be held. Please see Conference Programme Overview for room location. All speakers are requested to be in the session room 15 minutes prior the session. For sessions taking place in the early morning please hand in your presentation on the previous day. It is intended that speakers will give a good overview of their papers allowing some time for

CONFERENCE INFORMATION

questions and discussion. The duration of a presentation should be no more than 15 minutes, so speakers are requested not to try squeeze in too many slides. After presentation will be time for 5-minute discussion.

Exhibitions

Exhibitions will be placed on the ground floor next to registration desk.

Meals

Morning and afternoon coffee as well as lunches will be served in the O'Brien centre for Science. Lunches are included in the registration fee and you will need to show your conference badge to be served.

Parking

Out of term free parking is available in all campus car-parks apart from those designated for visitors, the sports centre or pay and display car-parks.

Accompanying Persons Programme

Accompanying persons are welcome to attend to Welcome Reception, Excursion to Glendalough and the Gala Dinner. We have also prepared a tour of Malahide Castle which required pre-booking.

SOCIAL PROGRAMME

Welcome Reception

Tuesday 12th June at 19:00-21:00

A Welcome Reception to renew acquaintances and meet new colleagues will take place in the O'Brien Centre for Science. All registered participants and registered accompanying persons are invited to attend. Beverages and a light buffet will be served.

Excursion to Glendalough and Taylors three Rock

Wednesday 13th June at 15:30 – 22:00

An excursion to Glendalough followed by an informal dinner at the Taylors Three Rock Pub will take place on Wednesday afternoon.

Glendalough

Glendalough - the valley of the two lakes, is a splendidly beautiful area in the heart of County Wicklow. It is also an example of one of the most famous monastic settlements of the day. Infamous for its history and legend it is a truly breath-taking area, which shouldn't be missed.

A professional hill walker will accompany the group on one of the most scenic and breath-taking tours in Ireland. There will be varying levels of difficulty available on the day from a gentle stroll to a moderate trails. Glendalough is one of those enchanted areas where the higher you go the more spectacular your view. This walk is sure to leave everyone with fond memories of Ireland.

For this element we advise all attendees to wear comfortable shoes and clothing.

Taylors Three Rock

The panoramic view and rural setting of Taylors Three Rock makes this venue one of the most idyllically set public houses in Dublin. This is a rambling farmhouse bar with the largest thatched roof in Ireland soaring to over 50 ft. Taylors Three Rock provides informal traditional music sessions in the relaxing farmhouse late night bar, which serves an array of superb food and drink.

Buses will depart from the car park close to the UCD Veterinary Hospital at 15:30. Further instructions on bus departure times from Glendalough and Taylors Three Rock will be provided by the tour guide.

Gala Dinner in The Round Room at the Mansion House, Dawson Street, Dublin 2

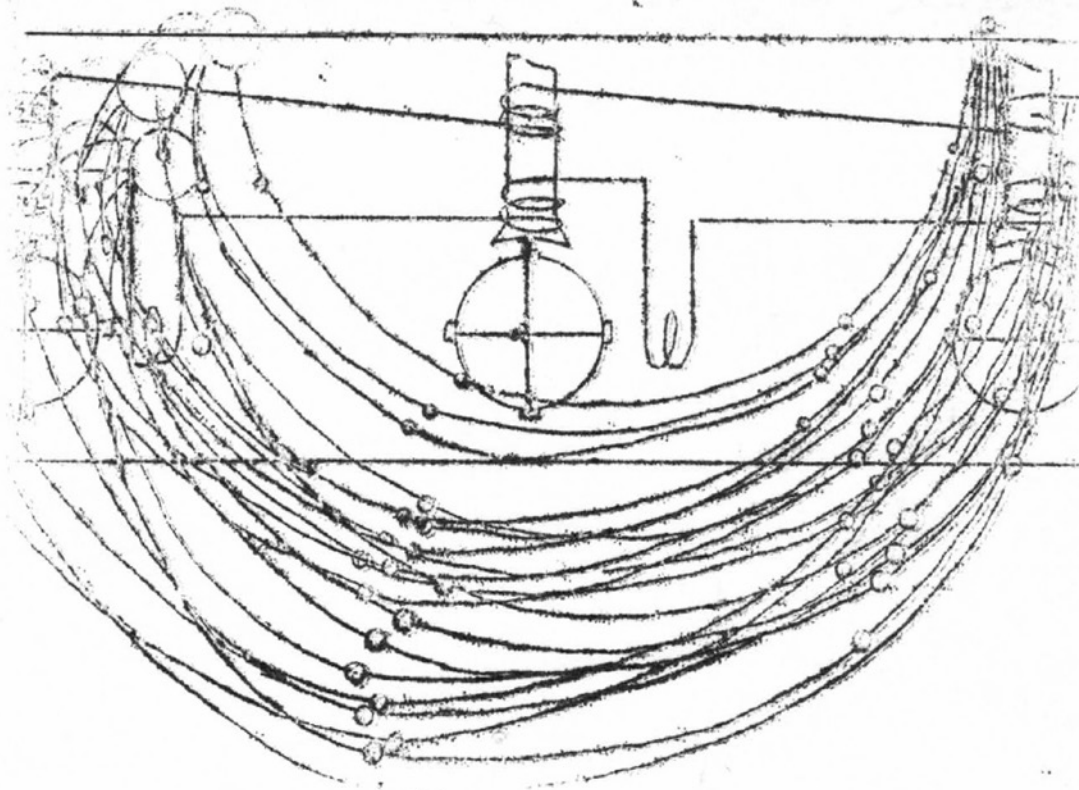
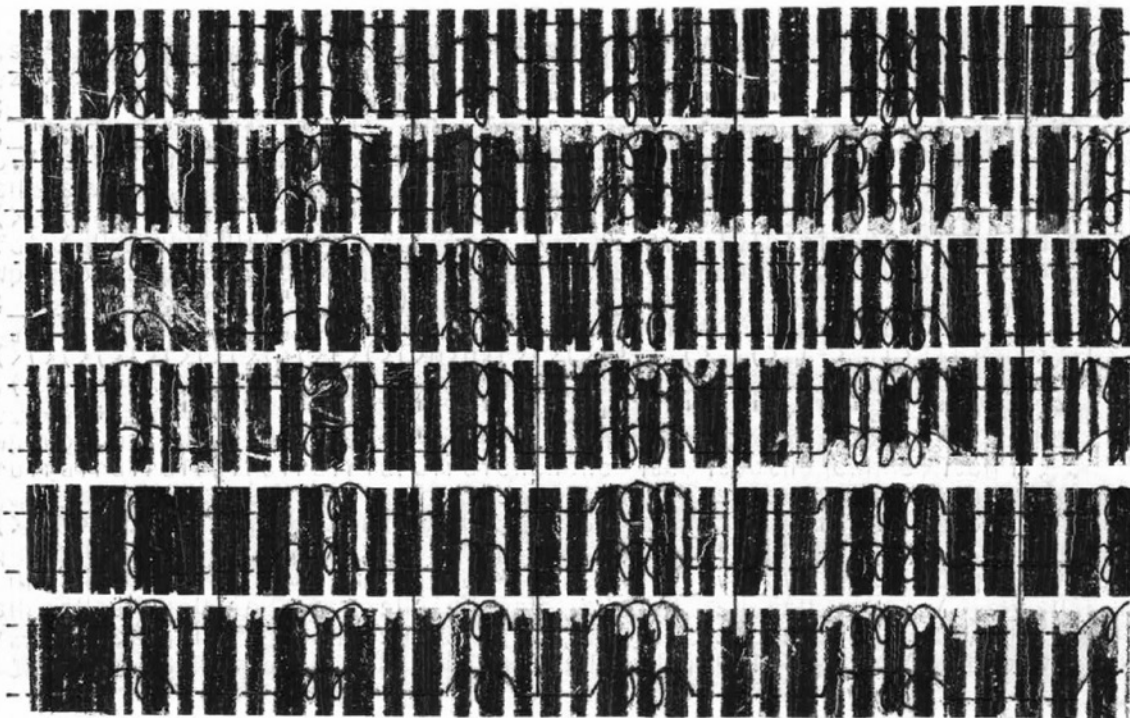
Thursday 14th June 2018 at 19:00 – 23:00

The Gala Dinner will take place in the Mansion House in Dublin City Centre around 5km from the conference venue. Note that there is no arranged transportation to the dinner, all participants are required to make their own way. You should estimate a travel time of around 30 minutes to the city centre by bus. The 46a and 145 stop outside the mansion House at Bus Stop No. 792.

The Mansion House was conceptualised in the 18th century by one of Ireland's great visionaries, Joshua Dawson. The Round Room was purpose designed in 1821 to receive King George IV. Remarkable political events have taken place here including the first ever meeting of the Dáil Eireann in 1919 and throughout the years it has proudly welcomed high-profile guests from across the globe including Pope John Paul II, Nelson Mandela, Queen Victoria, Prince Rainier III and Princess Grace of Monaco.

Dublin City

Dublin is a compact, charming blend of historical attractions and modern amenities, nestled between the mountains and the sea. From the invasion of the Vikings in the 8th Century, 700 years of Norman occupation, the rapid expansion of Georgian Dublin, the formation of the Republic of Ireland in the 1920's and the more recent transformation into a global services hub, the city has had a rich and varied history. Evidence of this can be found in every corner and from a cultural point of view, that means plenty for visitors to see, from historic sites and landmarks to famous monuments and thought-



SOCIAL PROGRAMME

provoking museums. Through this mixture of new and old you will find a Dublin that has grown into the cosmopolitan and vibrant city it is today; a city proud of its rich past but continuously striving towards the future.

The city is widely regarded for its commitment to the fields of literature, arts, music and theatre and is a designated UNESCO City of Literature. It has produced many notable literary figures, including Samuel Beckett, George Bernard Shaw, and William Butler Yeats, as well as playwrights and authors such as James Joyce, Bram Stoker, Oscar Wilde and Jonathan Swift. In addition to arts and theatre venues, Dublin is home to a variety of museums and music venues.

Dublin has a dynamic and diverse range of bars and clubs so whether you would like a velvety Guinness in a traditional pub, live Irish music in a candlelit café or cocktails in an Art Deco bar you will not be disappointed. The city is also home to a growing number of quality restaurants, casual eateries and cafés. Top-notch international cuisine and modern takes on Irish food are now commonplace so there are plenty of options to suit every palate.

The main language spoken in Dublin is English, however, street signs and official buildings are signposted in both English and Gaelic, the indigenous Irish language. Ireland's climate can be described as mild, moist and changeable with average temperatures from May to July ranging between 17°C – 20°C (64°F – 68°F). In June, the sun does not set until almost 10pm so there is plenty of opportunity to explore from dawn to dusk.

Venture south of the city along Dublin Bay and you will come to some of Dublin's most picturesque spots. The scenery changes rapidly from flat sandy beaches to rocky cliffs and coves harbouring picture perfect seaside towns and harbours. Sandycove, Dalkey and Killiney have preserved an old world charm and on a sunny day, you can even find an almost Mediterranean atmosphere here. To the North of Dublin you find the fishing harbour of Howth and Malahide, a quaint seaside town with a park and romantic 19th century castle. A local train line (DART) runs from Malahide and Howth in the north of the city through to Dun Laoghaire and Dalkey and further south to Bray and Greystones.

The currency used in Ireland is the Euro. Cash machines (ATMs) are widely available. Bank opening hours are typically between 10:00-16:00 Mondays to Fridays. Most hotels, shops, restaurants and bars accept all major debit and credit cards. Visa and Master Card are the most widely used credit cards in Ireland. You may need cash for taxis and for some public transport unless you have a LEAP card.

Shops are typically open from 9:00-18:00 Mondays to Saturdays. Many shops are open late on Thursdays and Fridays (typically up to 20:00) and a good number are also open from 12:00-18:00 on Sundays. Pubs open at 10:30 and close at 23:30 Mondays to Thursdays, 0:30 on Fridays and Saturdays. On Sundays, pubs open 12:30 and close at 23:30. Clubs and late night bars typically stay open until 2:30.

Dublin's tourist guide: www.visitdublin.com

Public Transport : *To and from the airport*

Aircoach

There is an excellent Aircoach service from Dublin Airport to UCD at very reasonable rates, maximum fare of €20 return. The bus 700 to Leopardstown stops close to the Stillorgan entrance to UCD in both directions. Aircoach buses can be booked in advance on line. Visit <http://www.aircoach.ie> for information on prices, timetables and online booking info.

Taxi

There are plenty of taxis in the airport starting at around €40 per journey. Please note that the cost of the journey varies depending on time of day, traffic conditions etc.

SOCIAL PROGRAMME

Public Transport : *From the city*

Dublin Bus

UCD Belfield campus is located 5 km south of the city centre and can be reached by 21 bus routes. These are detailed in the link below. A real-time Dublin Bus app is available for mobile devices to help plan your journey.
www.dublinbus.ie/

Cycling

Self-service Bicycle Hire Schemes are also available in Dublin.
<http://www.dublinbikes.ie> and <http://bleeperbike.com/#top>

Further information

This link provides further information on how to reach UCD Belfield campus - <http://ucdestates.ie/commuting/>

Travelling around Dublin

This link provides useful help in travelling around Dublin. www.visitdublin.com

Travelcard

The Leap Visitor Card is the most convenient public transport ticket available for tourists and visitors to Dublin. Get unlimited travel over your selected time period on Airlink, Dublin Bus, Luas, DART and Commuter Rail. (Please note that otherwise buses only take exact coins and do not give change. The cash fare from Dublin city centre to UCD is €2.70.)

Depending on how long you plan on staying, you can choose from a number of LEAP card options and find one that best suits your visit. You can find more information at about.leapcard.ie

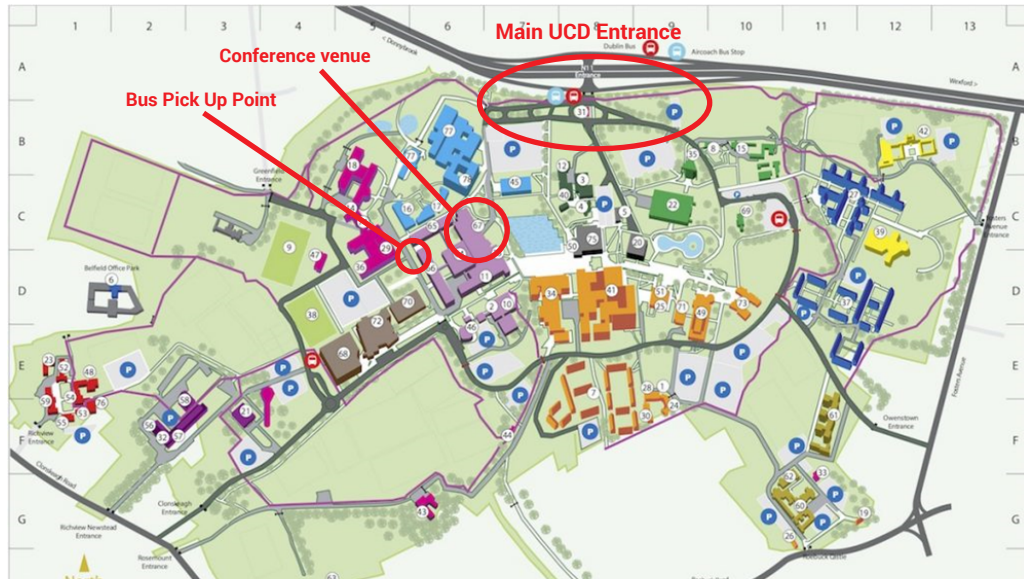
3 days (72 hours) – €19.50
7 days (168 hours) – €40.00

Artwork - Collaboration between Professor Federico Milano and artist Julie Merriman

Professor Federico Milano of the UCD School of Electrical & Electronic Engineering is the chair of the local organizing committee of PSCC 2018 and, as part of the organization, has collaborated with the UCD Artist in Residence for the College of Engineering and Architecture, Mrs Julie Merriman. Julie's work investigates mark making in the context of language; drawn, written and programmed. She is interested in how technology currently influences architectural and engineering projects and in the role it plays in linking an idea, its communication and visual realization.

The results of this collaboration is a series of artworks inspired to power systems, which can be seen at <http://www.psc2018.net/artwork.html>. A selection is printed in this programme and an exhibition of Julie's original works will also take place during the conference.

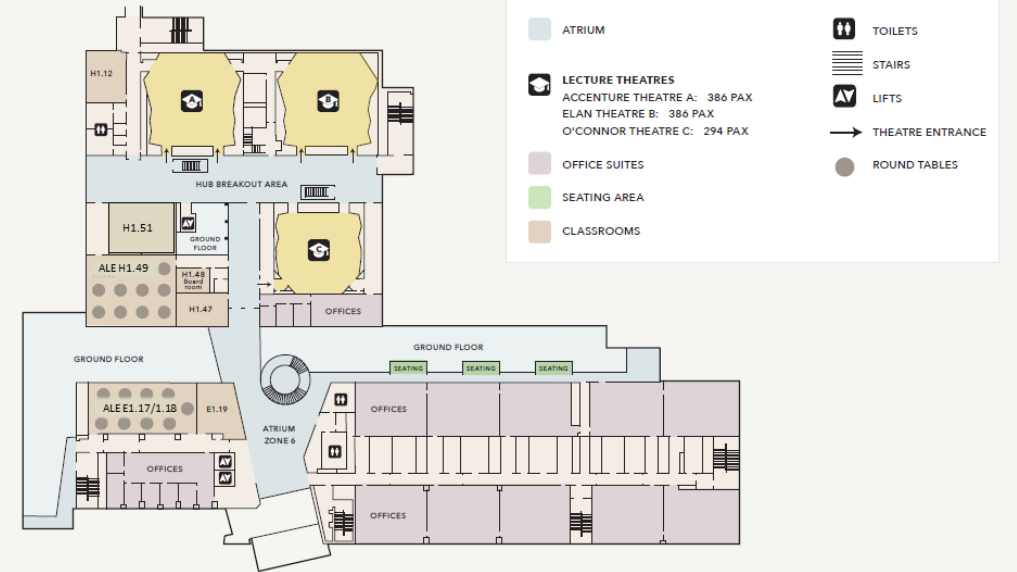
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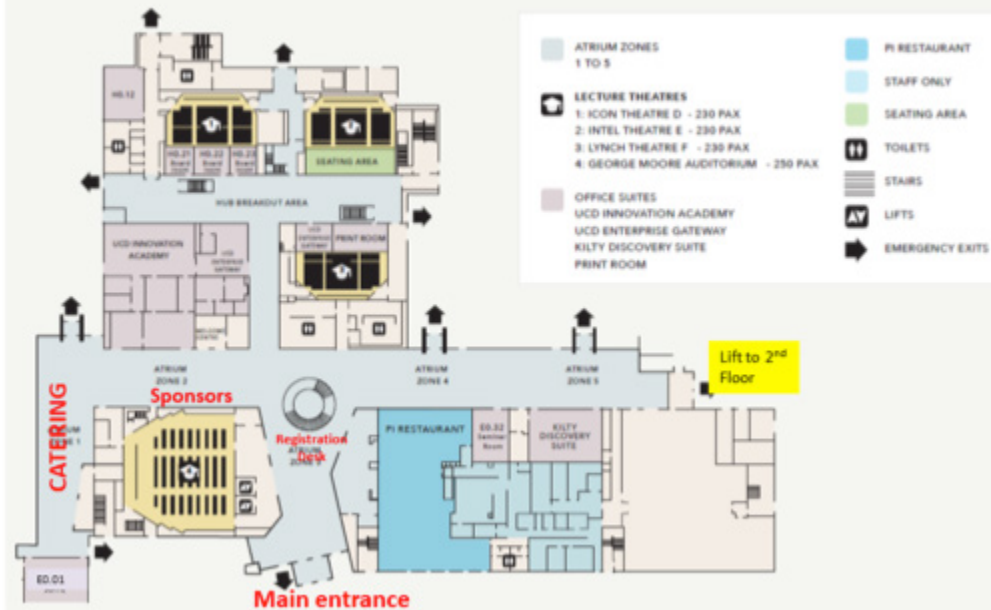
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O'BRIEN CENTRE FOR SCIENCE
FIRST FLOOR



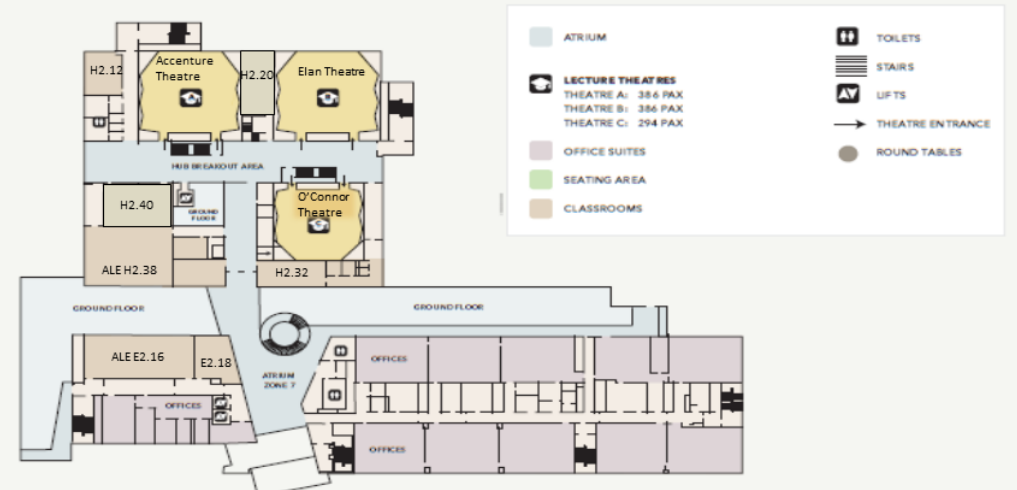
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O'BRIEN CENTRE FOR SCIENCE
GROUND FLOOR



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O'BRIEN CENTRE FOR SCIENCE
SECOND FLOOR



Accenture Theatre	Th. A SCI
	H2.20 SCI
Elan Theatre	Th. B SCI
O'Connor Theatre	Th. C SCI

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