2019

MEEPS

A Journey Towards a Future Power Grid

PROGRAMME

Manchester Energy and Electrical Power Systems Workshop
Friday, 1.11.2019, Manchester Meeting Place

Organised by

The IEEE PES Student Branch Chapter
The University of Manchester

IEEE PES Power & Energy Society

IEEE United Kingdom and Ireland Section

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MANCHESTER 1824
The University of Manchester

Welcome

Manchester, known throughout the world as the birthplace of the industrial revolution, has a proud history in science, politics, music, arts and sport. The city combines this heritage with a progressive vision to be a city that delivers surprise and delight in equal measures.

The history of Manchester began with a civilian settlement by the Romans about AD 79. In the early 19th century, Manchester began to expand rapidly following the boom brought by textile manufacturing, and the Port of Manchester, linked to the Irish Sea by a 36-mile-long canal, became the third-busiest port in the United Kingdom.

After the Second World War, deindustrialisation hit the city hard, but extensive investment and regeneration following the IRA bombing in 1996 gave the city new strength, and it has been named the most liveable city in the UK in 2018.

The University of Manchester traces its roots to the formation of the Mechanics' Institute in 1824. The university is now the second largest in the UK, with more than 40,000 students and 10,000 staff. 25 Nobel laureates are among its past and present members.

We have one of the largest **Electrical and Electronic Engineering** Departments in the UK, and we are renowned for our theoretical and applied research.

Working closely with users of our technology enables us to address the challenges faced by manufacturing, utility, health and non-profit organisations, as well as government policymakers. As a result our research base continues to grow, develop and adapt to better serve industry and wider society.

The IEEE PES Student Branch Chapter at The University of Manchester was officially launched on 28 June 2012. The Chapter is driven by PhD students in EEE and an academic advisor. It is the first IEEE PES Student Chapter in the UKRI Section and boasts more members than any other UK university-based student branch.

Achievements:

- 2019 IEEE Region 8 Chapter of the Year Award (for Medium Size Student Branch)
- 2018, 2017 and 2016 IEEE PES High Performance Student Branch Chapter
- 2015 IEEE Darrel Chong Student Activity Award – SILVER
- 2014 IEEE Darrel Chong Student Activity Award – BRONZE

Programme

Opening

08:30 – 09:00 **Registration, Tea and Coffee**

09:00 – 09:10 **Welcome by the Chair of IEEE PES Student Branch Chapter**
Mingyu Han, The University of Manchester

09:10 – 09:50 **Opening Address**
Dr Diptargha Chakravorty
Senior Consultant Network and Innovation Team at TNEI Services

Oral Session 1

Operation, Planning and Analysis of Future Energy Networks

09:50 – 10:15 **Keynote Speech: The times they are a-changing'**
Dr Greg Dujon,
Head of Network Strategy & Transformation at EA Technology

10:15 – 10:30 **Increasing Power Network Reliability using Emergency Rating in a Lifecycle Analysis**
Keyi Wang, The University of Manchester

10:30 – 10:45 **Identification of Oscillatory Instability in Power Systems Using Wavelet Transform**
Ambreen Khurram, University of Leeds

10:45 – 11:00 **Flexineering Buildings: Design and Implementation of Control Strategies for Dynamic Response**
Rami El Geneidy, University of Loughborough

11:00 – 11:15 **A Bottom-Up Supply-Side Simulation Model of Residential and Community Energy Systems using System Dynamics**
Bilal Bugaje, University of Nottingham

11:15 – 11:30 **Capability of a Stochastic Multi-Energy Virtual Power Plant to Provide Network Services to a Future Power Grid**
James Naughton, University of Birmingham

11:30 – 11:50 **Tea and Coffee**

Panel

11:50 – 12:45 **Panel Session**

12:45 – 13:30 **Lunch**

In each poster session, presenters will give a brief 2-minute pitch about their work. You are invited to attend these short presentations, but you are also free to look around at the other posters.

Poster Session 1

13:30 – 14:00

Wide-Area Oscillation Damping in Low-Inertia Grids under Time-Varying Communication Delays
Poster 1 – Sultan Alghamdi, University of Leeds

Including EV Charging/Discharging Operation in Generalised Control-Oriented Framework for Multi-Energy Systems
Poster 2 – Anita Aliu, The University of Manchester

An Economic Model for Offshore Transmission Asset Planning Under Severe Uncertainty
Poster 3 – Henna Bains, University of Durham

The Impact of VSC-HVDC Reactive Power Control Schemes on Voltage Stability
Poster 4 – Josep Bernat, The University of Manchester

Incorporation of Active Power Ancillary Services into VSC-HVDC Connected Energy Sources
Poster 5 – Surat Asvapoositkul, The University of Manchester

A case for technical optimality when integrating minigrids and the main grid in sub-Saharan Africa
Poster 6 – Madalitso Chikumbanje, University of Strathclyde

A Distributionally Adaptive Robust Microgrid Investment Planning Model Using Wasserstein Metric-Based Affine Policies
Poster 7 – Dr Shahab Dehghan, University of Leeds

Low-carbon technologies and the influence of changing load profiles on transformer thermal failure rates
Poster 8 – James Hill, The University of Manchester

Operation Strategy for Grid-connected Battery Energy Storage Systems
Poster 9 – Siwei Liu, The University of Manchester

Poster Session 2

14:00 – 14:45

Operational Planning with Steady-state and Dynamic Islanding Constraints to Increase Microgrid Survivability and Resilience
Poster 10 – Agnes Marjorie Nakiganda, University of Leeds

Impact of LCC HVDC Transmission on Numerical Distance Protection in IEC 61850 Based Environment as Applied to Java 500 kV AC System
Poster 11 – Eko Prasetyo, The University of Manchester

NSGA II/Lambda-Iteration Approach to Optimal Generation Maintenance Scheduling
Poster 12 – Luis Salinas San Martin, University of Glasgow

Extending The Energy Storage Lifetime Using PSM Method
Poster 13 - Budyanto Jo Salli, University of Coventry

Control Oriented Modelling for Energy Management in Multi-Energy Districts
Poster 14 – Michael Taylor, The University of Manchester

Efficient Optimal Power Flow for Microgrids
Poster 15 – Danish Khatri, The University of Manchester

Review of Area and Volume Effects on Breakdown Voltage of Transformer Liquids
Poster 16 – Haichuan Yu, The University of Manchester

Impact of Fast Frequency Response on Power System Transient Stability
Poster 17 – Zaichun Zhan, The University of Manchester

14:45 – 15:00 **Tea and Coffee**

Oral Session 2

Advanced Technologies Applications

15:00 – 15:25 **Keynote Speech: Data-driven decentralised control design in distribution networks**
Dr Petros Aristidou,
Lecturer in Smart Energy Systems at the University of Leeds

15:25 – 15:40 **Integration of Ultra-High Temperature Thermal Storage (UHTS) with Electricity and Heat Networks**
Haris Hussain, University of Edinburgh

15:40 – 15:55 **Optimal Design Conductive and Inductive Charging System for Bus Rapid Transit Network**
Adedayo Asaolu, University of Strathclyde

15:55 – 16:10 **Implementation of Radial Basis Function (RBF) Network for PV Fault Detection using Dual Input**
Muhammad Hussain, University of Huddersfield

16:10 – 16:25 **Phase-Change Material-Based Thermal Energy Storage for District Cooling Systems**
Hector Bastida, University of Cardiff

16:25 – 16:40 **Comparison of Different Methodologies for Analysing SSR in Wind Power Plants**
Youhong Chen, The University of Manchester

Closing

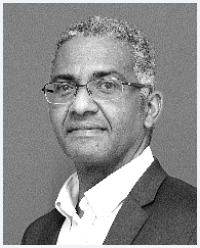
16:40 – 17:00 **Awards, with Closing Remarks from Dr Andrea Ballanti**

Speakers

Dr Diptargha Chakravorty

Senior Consultant Network and Innovation Team at TNEI Services

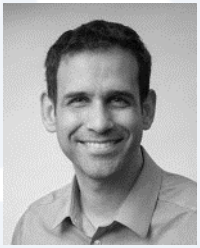
Dr Diptargha Chakravorty received his PhD degree from Imperial College London in 2017. He is currently working in TNEI Services as a Senior Consultant within the Networks and Innovation team. His core expertise includes power system stability analysis, grid integration of renewable energy and dynamic demand response. He is involved in several innovation projects with DNOs, ESO and other stakeholders. He is actively involved in the Cigre working group C4 and also Cigre UK NGN steering committee and is currently the UK events lead.



Dr Greg Dujon

Head of Network Strategy & Transformation at EA Technology

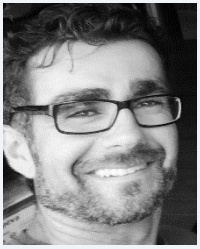
Greg is currently responsible for providing strategic direction and insights to energy delivery companies including Electricity Distribution Network Operators in the integration, implementation and management of renewable energy sources, electrification of heat and transport and Distributed Energy Resources. He began his career in the Energy Sector as a Product Manager for the Quantum Gas Prepayment system and managed its implementation from the monopoly gas supply market to the deregulated and competitive market.
He also held several senior management roles in Siemens Energy Division before joining EA Technology Limited in 2019. During his time at Siemens, he led several Strategic M&A activities to expand the addressable market. Additionally, Greg was responsible for the overall operational enterprise IT landscape for Siemens UK covering 14 businesses and 15 000 employees.



Dr Petros Aristidou

Lecturer in Smart Energy Systems at the University of Leeds

Petros received his PhD in Engineering Sciences in July 2015 from the University of Liège, Belgium, and a Diploma in Electrical & Computer Engineering from the National Technical University of Athens, Greece, in 2010. After his PhD, he joined the Power Systems Laboratory of the Swiss Federal Institute of Technology in Zurich (ETH Zürich) where he worked as a postdoctoral researcher.
Petros is now a Lecturer (Assistant Professor) at the University of Leeds. He works on making future electric power systems sustainable, secure, and resilient.
His research brings together mathematical tools from the areas of numerical analysis and optimisation, with high-performance computational tools and machine learning techniques, to tackle modern power system problems.



Dr Andrea Ballanti

Forecasting Engineer at Electricity North West

Dr Andrea Ballanti received the BSc and MSc from the University of Cagliari, Italy in 2010 and 2013 respectively. In 2017 he received a Ph.D. in Electrical Engineering from the University of Manchester, UK. Dr A. Ballanti was responsible for delivering voltage capability assessment results in the £9 million Smart Grid Project “Customer Load Active System Services” (CLASS). In 2018 he joined Electricity North West, where he is currently a member of the DSO transition team and mainly responsible for the long-term forecasting of electricity demand, generation and storage of the Electricity North West region.

Prizes

The prizes will be judged by a panel made up of academics and engineers from industry and are as follows:

- **£150** for the best oral presentation
- **£100** for the best poster and **£50** for the runner-up
- **£100** for the Research for Industry Award

Organising Committee

Mingyu Han (Chair)
Siwei Liu (Vice-Chair)
Surat Asvapoositkul (Secretary)
Anita Aliu (Industry Liaison)
Keyi Wang (Treasurer)
Matthias Noebels (Event & Publicity Officer)
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Danish Khatri (Event & Publicity Officer Assistant)
Haichuan Yu (Web Coordinator Assistant)
Harry McDonald (Events Coordinator Assistant)
Dr Robin Preece (Academic Advisor)

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