

**2018 IEEE International
Conference on Communications,
Control, and Computing
Technologies for Smart Grids
(SmartGridComm 2018)**

**Aalborg, Denmark
29 – 31 October 2018**



**IEEE Catalog Number: CFP18SGC-POD
ISBN: 978-1-5386-7955-5**

**Copyright © 2018 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP18SGC-POD
ISBN (Print-On-Demand):	978-1-5386-7955-5
ISBN (Online):	978-1-5386-7954-8

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Monday, October 29

Monday, October 29 8:30 - 9:20

K1: Keynote speaker 1

Room: Kilden

Monday, October 29 9:20 - 9:30

K1.A: Smart Grid Emerging Technology White Paper

Room: Kilden

Emerging Technologies Initiative 'Smart Grid Communications': Information Technology for Smart Utility Grids

Hans-Peter Schwefel (Aalborg University, Denmark); Ying Jun (Angela) Zhang (The Chinese University of Hong Kong, Hong Kong); Christian Wietfeld (TU Dortmund University, Germany); Hamed Mohsenian-Rad (University of California, Riverside, USA)

Monday, October 29 9:50 - 11:20

S1.1: Attack Detection in Smart Grids

Cyber security and privacy

Room: Kilden

Chair: Teklemariam Tesfay (Arizona State University (ASU), USA)

Correlation-based Detection of PMU Time Synchronization Attacks

Ezzeldin Shereen and György Dán (KTH Royal Institute of Technology, Sweden)

EDMAND: Edge-Based Multi-Level Anomaly Detection for SCADA Networks

Wenyu Ren and Timothy Yardley (University of Illinois at Urbana-Champaign, USA); Klara Nahrstedt (University of Illinois, USA)

Securing Substations through Command Authentication Using On-the-fly Simulation of Power System Dynamics

Daisuke Mashima and Binbin Chen (Advanced Digital Sciences Center, Singapore); Toby Zhou (ADSC, Singapore); Ramkumar Rajendran and Biplab Sikdar (National University of Singapore, Singapore)

Detection of False Data Injection Attacks in Smart Grids Based on Forecasts

Michael Kallitsis (University of Michigan & Merit Network, Inc., USA); Shrijita Bhattacharya (University of Michigan, USA); George Michailidis (University of Florida, USA)

PhasorSec: Protocol Security Filters for Wide Area Measurement Systems

Prashant Anantharaman (Dartmouth College, USA); Kartik Palani (University of Illinois at Urbana Champaign, USA); Rafael Brantley, Galen Brown, Sergey Bratus and Sean W Smith (Dartmouth College, USA)

S2.1: Energy Monitoring and Control via Communications

Communications and networking

Room 1

Chair: Christian Wietfeld (TU Dortmund University, Germany)

Practical Evaluation of UK Internet Network Characteristics For Demand-Side Response Applications

Mehdi Zeinali (The University of Edinburgh, United Kingdom (Great Britain)); John Thompson (University of Edinburgh, United Kingdom (Great Britain))

Robust Wireless Sensor Networks for Transmission Line Monitoring in Taiwan

Peng-Yong Kong (Khalifa University, United Arab Emirates); Kai-Sheng Tseng, Joe-Air Jiang and Chih-Wen Liu (National Taiwan University, Taiwan)

Electrical Appliance Classification using Deep Convolutional Neural Networks on High Frequency Current Measurements

Daniel Jorde (Technical University of Munich, Germany); Thomas Kriechbaumer (Technische Universität München, Germany); Hans-Arno Jacobsen (Technical University Munich, Germany)

Residential Remote Load Scheduling and Control for Smart Homes with LabVIEW Interface

Nikoleta Andreadou (Energy Security, Distribution and Markets Unit, Joint Research Centre, European Commission, Italy); Fausto Bonavitacola (Energy Security, Distribution and Markets Unit, Joint Research Centre, EC, Italy)

Distributed Cooperative Energy Management in Smart Microgrids with Solar Energy Prediction

An Chen, Wen-Zhan Song, Fangyu Li and Javad Mohammadpour Velni (University of Georgia, USA)

S3.1: Management and Value Proposition for Energy Demand and Storage

Control and operation

Room 2

Chair: Katherine Davis (PowerWorld Corporation, USA)

Demand Charge and Response with Energy Storage

Kiyoshi Nakayama (NEC Laboratories America, USA); Ratnesh Sharma (NEC Laboratories America Inc, USA)

Added Value of Individual Flexibility Profiles of Electric Vehicle Users For Ancillary Services

Peter Andersen, Tiago Sousa, Andreas Thingvad, Lea Sass Berthou and Murat Kulahci (Technical University Of Denmark, Denmark)

Intelligent Electric Water Heater Control with Varying State Information

Thijs Peirelinck, Christophe Patyn and Geert Deconinck (KU Leuven, Belgium); Ann Nowé (Vrije Universiteit Brussel, Belgium)

Low Complexity Closed-Loop Energy Manager for a Grid-Tied PV System with Battery

Daniel Bonilla Licea (Université Internationale de Rabat, Morocco); Mounir Ghogho (International University of Rabat, Morocco & University of Leeds, United Kingdom (Great Britain))

Long-Term Revenue Estimation for Battery Performing Arbitrage and Ancillary Services

Md Umar Hashmi (INRIA Paris & École Normale Supérieure, France); Wael Labidi (Telecom Sud Paris, France); Ana Basic (INRIA / ENS, France); Salah Eddine Elayoubi (CentraleSupélec, France); Tijani Chahed (Telecom SudParis, France)

T1: Reliable Control using Unreliable Communication Media

Room 4

WS1.1: Blockchain in Energy

WS1 part 1

Room 3

Monday, October 29 11:30 - 13:00

S1.2: Attacks, Attack Impacts and Defenses

Cyber security and privacy

Room: Kilden

Chair: Katherine Davis (Texas A&M University, USA)

On the Impact of Synchronization Attacks on Distributed and Cooperative Control in Microgrid Systems

Mingxiao Ma and Abdelkader Lahmadi (LORIA, France)

Impact of Malicious SCADA Commands on Power Grids' Dynamic Responses

Hui Lin (University of Nevada, Reno, USA); Zbigniew Kalbarczyk (University of Illinois at Urbana Champaign, USA); Ravishankar Iyer (University of Illinois at Urbana-Champaign, USA)

AVAIL: Assured Volt-Ampère Information Ledger

Teklemariam Tesfay (Arizona State University (ASU), USA); Mahdi Jamei, Anna Scaglione and Mojdeh Khorsand (Arizona State University, USA); Kory Hedman (ASU, USA); Rida Bazzi (Arizona State University, USA)

Unobservable False Data Injection Attacks against PMUs: Feasible Conditions and Multiplicative Attacks

Zhigang Chu (Arizona State University, USA); Jiazi Zhang (National Renewable Energy Laboratory, USA); Oliver Kosut and Lalitha Sankar (Arizona State University, USA)

EDSGuard

Vu Coughlin, Carlos Rubio-Medrano, Ziming Zhao and Gail-Joon Ahn (Arizona State University, USA)

S2.2: Communications and networking

Communications Design for Energy Networks

Room 1

Chair: Nikoleta Andreadou (Energy Security, Distribution and Markets Unit, Joint Research Centre, European Commission, Italy)

Automated Negotiation for Opportunistic Energy Trading Between Neighboring Wireless Sensor Networks

Andre P. Ortega (University of Southampton, United Kingdom (Great Britain) & Escuela Superior Politecnica del Litoral, Ecuador); Geoff V Merrett and Sarvapali Ramchurn (University of Southampton, United Kingdom (Great Britain))

Automating Smart Grid Solution Architecture Design

Massimiliano Masi (Tiani Spirit GmbH, Austria); Tanja Pavleska (Jozef Stefan Institute, Slovenia); Helder Aranha (Espap, IP, Portugal)

Simulation-based Parameter Optimization Framework for Large-Scale Hybrid Smart Grid Communications Systems Design

Adarsh Hasandka (University of Colorado Boulder & National Renewable Energy Laboratory, USA); Jianhua Zhang, S M Shafiul Alam, Anthony Florita and Bri-Mathias Hodge (National Renewable Energy Laboratory, USA)

Performance Evaluation of IEC 61850-90-5 over a latency optimized 3GPP LTE Network

Gargi Bag (ABB, Sweden); Morgan Johansson, Luka Lednicki and Jonas Neander (ABB Corporate Research, Sweden); Linus Eriksson (Uppsala Universitet, Sweden); Rajendra Bogati (KTH Royal Institute of Technology, Sweden); Petri Hovila (ABB, Finland); Juha Saarinen and Johan Torsner (Ericsson Research, Finland)

S3.2: Real-time operation algorithms in smart grids

Control and operation

Room 2

Chair: Anna Scaglione (Arizona State University, USA)

Joint Frequency Regulation and Economic Dispatch Using Limited Communication

Jianan Zhang (Massachusetts Institute of Technology, USA); Eytan Modiano (MIT, USA)

Optimal Decentralized Coordination of Voltage-Controlled Sources in Islanded Microgrids

Mithun Mallick and Pirathayini Srikantha (Western University, Canada)

An Autonomous Demand Response Algorithm based on Online Convex Optimization

Shahab Bahrami, Christine Chen and Vincent W.S. Wong (University of British Columbia, Canada)

Bayesian Detection of Islanding Events Using Voltage Angle Measurements

Tin Rabuzin, Jan Lavenius and Nathaniel Taylor (KTH Royal Institute of Technology, Sweden); Lars M Nordström (Royal Institute of Technology, KTH, Sweden)

A Fast Algorithm for Optimal Power Scheduling of Large-Scale Appliances with Temporally-Spatially Coupled Constraints

Zhenwei Guo and Qinmin Yang (Zhejiang University, P.R. China); Zaiyue Yang (Southern University of Science and Technology, P.R. China)

T2: Smart battery pack

Room 4

WS1.2: Blockchain in Energy

WS1 part 2

Room 3

Monday, October 29 14:00 - 15:30

S2.3: Data Analysis and Communication for the Smart Grid

Communications and networking

Room 1

Chair: Jianhua Zhang (National Renewable Energy Laboratory, USA)

Cellular Network Coverage Analysis and Optimization in Challenging Smart Grid Environments

Stefan Monhof, Stefan Böcker, Janis Tiemann and Christian Wietfeld (TU Dortmund University, Germany)

Data Models and Protocol Mapping for Reduced Communication Load in Substation Automation with High Sampling Rate Protection Applications

Fabian Hohn (KTH Royal Institute of Technology, Sweden); Lars M Nordström (Royal Institute of Technology, KTH, Sweden)

Optimized Scheduling of Smart Meter Data Access: A Parametric Study

Mohammed Seifu Kemal (Aalborg Univeristet, Denmark); Rasmus Olsen and Hans-Peter Schwefel (Aalborg University, Denmark)

Logarithmic Utilities for Aggregator Based Demand Response

Nouman Ashraf (Frederick University, Cyprus); Saher Javaid (Japan Advanced Institute of Science and Technology (JAIST), Japan); Marios Lestas (Frederick University, Cyprus)

S3.3: Models/ Approaches for Economic Operations, Market Participation

Control and operation

Room 2

Chair: Kiyoshi Nakayama (NEC Laboratories America, USA)

Energy Contract Settlements through Automated Negotiation in Residential Cooperatives

Shantanu Chakraborty (The University of Melbourne, Australia); Tim Baarslag and Michael Kaisers (Centrum Wiskunde and Informatica (CWI), The Netherlands)

Distributionally Robust Chance-Constrained Bidding Strategy for Distribution System Aggregator in Day-Ahead Markets

Arijit Bagchi (Singapore University of Technology and Design, Singapore); Yunjian Xu (Chinese University of Hong Kong,

Hong Kong)

Stackelberg Game-Theoretic Strategies for Virtual Power Plant and Associated Market Scheduling Under Smart Grid Communication Environment

Weiqi Hua and Hongjian Sun (Durham University, United Kingdom (Great Britain)); Hao Xiao and Wei Pei (Institute of Electronic Engineering, Chinese Academy of Sciences, P.R. China)

Real-time enforcement of local energy market transactions respecting distribution grid constraints

Jose Horta (Telecom ParisTech, France); Eitan Altman (INRIA, France); Mathieu Caujolle (EDF, France); Daniel Kofman (Telecom Paristech, France); David Menga (EDF R&D, France)

Blockchain-Based and Multi-Layered Electricity Imbalance Settlement Architecture

Pietro Danzi (Aalborg University, Denmark); Sarah Hambridge (Grid Singularity GmbH, Germany); Čedomir Stefanović (Aalborg University & University of Novi Sad, Denmark); Petar Popovski (Aalborg University, Denmark)

T3.1: General and powerful flexibility modeling

T3 part 1

Room 4

WS2.1: Reliable Power Electronic-based Smart Grids (PESGs)

WS2 part 1

Room 3

Monday, October 29 16:00 - 17:30

T3.2: General and powerful flexibility modeling

T3 part 2

Room 4

WS2.2: Reliable Power Electronic-based Smart Grids (PESGs)

WS2 part 2

Room 3

Tuesday, October 30

Tuesday, October 30 8:30 - 9:20

K2: Keynote speaker 2

Room: Kilden

Tuesday, October 30 9:50 - 11:20

S3.4: Secure and fault tolerant grid operations

Control and operation

Room 3

Chair: Yunjian Xu (Chinese University of Hong Kong, Hong Kong)

Power System Equipment Cyber-physical Risk Assessment Based on Architecture and Critical Clearing Time

Hao Huang and Katherine Davis (Texas A&M University, USA)

DER allocation and line repair scheduling for storm-induced failures in distribution networks

Derek Chang (Massachusetts Institute of Technology, USA); Devendra Shelar (MIT, USA); Saurabh Amin (Massachusetts Institute of Technology & MIT, USA)

Low-Resolution Fault Localization Using Phasor Measurement Units with Community Detection

Mahdi Jamei and Anna Scaglione (Arizona State University, USA); Sean Peisert (Lawrence Berkeley National Laboratory, USA)

Towards Concise Models of Grid Stability

Vadim Arzamasov (Karlsruhe Institute of Technology, Germany); Klemens Böhm and Patrick Jochem (KIT, Germany)

S4.1: Forecasting, Disaggregation and Data generation

Data analytics and computation

Room 2

Chair: Fabrizio Sossan (EPFL, Switzerland)

Generative Adversarial Network for Synthetic Time Series Data Generation in Smart Grids

Chi Zhang, Sanmukh Kuppannagari, Rajgopal Kannan and Viktor K. Prasanna (University of Southern California, USA)

Short-Term Load Forecasting based on ResNet and LSTM

Hyungeun Choi, Seunghyoung Ryu and Hongseok Kim (Sogang University, Korea)

Short-term Electric Load Prediction using Multiple Linear Regression Method

Juntae Kim (University of California, San Diego, USA); Seokheon Cho (UCSD, USA); Kabseok Ko (University of California, San Diego, USA); Ramesh R. Rao (UCSD, USA)

Adjusted Feature-Aware k-Nearest Neighbors: Utilizing Local Permutation-Based Error for Short-Term Residential Building Load Forecasting

Marcus Voß and Asmaa Haja (Technische Universität Berlin (TU Berlin), Germany); Sahin Albayrak (Technische Universität Berlin, Germany)

Behind-the-Meter Solar Generation Disaggregation using Consumer Mixture Models

Chung-Ming Cheung, Wen Zhong, Chuanxiu Xiong, Ajitesh Srivastava, Rajgopal Kannan and Viktor K. Prasanna (University of Southern California, USA)

SS1: Special Session: Coupling Multi-Energy in Future Digital Power Grid

Room 4

Chair: Yang Yu (Tsinghua University, P.R. China)

Coordinated Planning of Multi-Energy System with District Heating Network

Guangsheng Pan (Southeast University, P.R. China); Wei Gu (Southeast University, P.R. China); Shuai Lu, Shuai Yao and Chenyu Wu (Southeast University, P.R. China)

Feasible Region of Coupling Multi-Energy System: Modeling, Characterization and Visualization

Yongfeng Zhang (University of Jinan, P.R. China); Hsiao-Dong Chiang (Cornell University, USA); Jia Su (Tianjin University, P.R. China)

Generalized Modeling of Self-scheduling Demand Resource in Multi-Energy System

Sheng Wang, Yi Ding and ChangZheng Shao (Zhejiang University, P.R. China)

To Rent or to Share?

Xingyu Gao and Kui Wang (Tsinghua University, P.R. China); Yang Yu (Stanford University, USA)

WS3.1: Data, Analytics, and Synchrophasors

WS3 part 1

Room: Kilden

WS4.1: Future Distribution Grids

WS4 part 1

Room 1

Tuesday, October 30 11:30 - 13:00

S3.5: Operation and Integration of Electric Vehicles in Smart Grid

Control and operation

Room 3

Chair: Weiqi Hua (Durham University, United Kingdom (Great Britain))

Combinatorial Optimization of Electric Vehicle Charging in AC Power Distribution Networks

Majid Khonji (Masdar Institute, Khalifa University, United Arab Emirates); Sid Chi-Kin Chau (Australian National University, Australia); Khaled Elbassioni (Masdar Institute of Science and Technology, United Arab Emirates)

Large-Scale Adaptive Electric Vehicle Charging

Zachary J Lee, Daniel Chang and Cheng Jin (California Institute of Technology, USA); George S Lee (Caltech, USA); Rand Lee (California Institute of Technology, USA); Ted Lee (PowerFlex Systems, USA); Steven Low (California Institute of Technology, USA)

Online Price-based Vehicle-to-Station Recommendations for EV Battery Swapping

Liang Ni (Hong Kong University of Science and Technology, Hong Kong); Bo Sun (The Hong Kong University of Science and Technology, Hong Kong); Xiaoqi Tan (University of Toronto, Canada); Danny H.K. Tsang (HKUST, Hong Kong)

Offline and online scheduling of electric vehicle charging with a minimum charging threshold

Martijn Schoot Uiterkamp, Thijs van der Klauw, Marco Gerards and Johann Hurink (University of Twente, The Netherlands)

Joint Optimal Power Flow Routing and Decentralized Scheduling with Vehicle-to-Grid Regulation Service

Shiyao Zhang and Ka-Cheong Leung (The University of Hong Kong, Hong Kong)

SS2: Special Session: Energy Flexibility - Modeling and Management

Room 4

Chair: Torben B Pedersen (Aalborg University, Denmark)

Battery Scheduling in a Residential Multi-Carrier Energy System Using Reinforcement Learning

Brida Mbuwir (KU Leuven & EnergyVille, Belgium); Mahtab Kaffash (KU Leuven / EnergyVille, Belgium); Geert Deconinck (KU Leuven, Belgium)

Energy Flexibility for Systems with large Thermal Masses with Applications to Shopping Centers

Joakim Børllum Petersen, Jan Bendtsen, Pierre Vogler-Finck and Jakob Stoustrup (Aalborg University, Denmark)

Robust Model Predictive Control with Scenarios for Aggregators in Grids with High Penetration of Renewable Energy Sources

Jacopo Parvizi and John Jørgensen (Technical University of Denmark, Denmark); Henrik Madsen (Technical University of Denmark, Denmark & NTNU, Norway)

Modeling and Managing Energy Flexibility Using FlexOffers

Bijay Neupane, Torben B Pedersen and Laurynas Siksnys (Aalborg University, Denmark)

SS3: Special Session: Data analytics for future electricity market design and operation

Room 2

Chair: Yang Yu (Tsinghua University, P.R. China)

Sensitivity-Based Critical Measurement Identification of State Estimation: From A CPS Perspective

Xinzhan Liu (China Southern Power Grid, P.R. China); Luo Xu, Qinglai Guo, Tongtian Sheng and Tianyu Yang (Tsinghua University, P.R. China); Yu Huang and Zanhong Wu (China Southern Power Grid, P.R. China)

Who Should Pay for the Mileage Payment?

Kui Wang, Xingyu Gao and Chenye Wu (Tsinghua University, P.R. China)

A Data-Driven Dispatching Approach for Sustainable Exploitation of Demand Response Resources

Bo Zeng, Xuan Wei and Jiahuan Feng (North China Electric Power University, P.R. China)

WS3.2: Data, Analytics, and Synchronphasors

WS3 part 2

Room: Kilden

WS4.2: Future Distribution Grids

WS4 part 2

Room 1

Tuesday, October 30 14:00 - 15:30

P: Panel: Electric vehicles in the smart grid: A reality check from real-life deployments

Room: Kilden

T4.1: PMU data science for blackout and cyber attack

T4 part 1

Room 2

WS4.3: Future Distribution Grids

WS4 part 3

Room 1

WS5.1: Smarter buildings

WS5 part 1

Room 4

Virtualized Software Defined Buildings: a Key Enabler of The Future Smart Cities

Mohamed Amine Abid and Hermann de Meer (University of Passau, Germany)

A plug-and-play home energy management algorithm using optimization and machine learning techniques

Kaveh Paridari (KTH Royal Institute of Technology, Sweden); Donald Azuatalam (The University of Sydney, Australia); Archie Chapman (University of Sydney, USA); Gregor Verbic (The University of Sydney, Australia); Lars M Nordström (Royal Institute of Technology, KTH, Sweden)

Clustering-based negotiation profiles definition for local energy transactions

Ângelo Pinto (Polytechnic Institute of Porto, Portugal); Tiago Pinto (University of Salamanca, Spain); Isabel Praça (School of Engineering (ISEP) / Polytechnic Institute of Porto (IPP) & Knowledge Engineering and Decision Support Research Center (GECAD), Portugal); Zita Vale (Polytechnic Institute of Porto, Portugal)

Assessment of Distributed Generation Units Remuneration Using Different Clustering Methods for Aggregation

Catia Silva, Pedro Faria and Zita Vale (Polytechnic Institute of Porto, Portugal)

Financial Benefit Analysis of an Electric Water Heater with Direct Load Control in Demand Response

Md Tofael Ahmed (Polytechnic of Porto, Portugal); Pedro Faria and Zita Vale (Polytechnic Institute of Porto, Portugal)

Tuesday, October 30 16:00 - 17:30

OCM: Organisation Committee Meeting

Room: Kilden

T4.2: PMU data science for blackout and cyber attack

T4 part 2

Room 2

WS4.4: Future Distribution Grids

WS4 part 4

Room 1

WS5.2: Smarter buildings

WS5 part 2

Room 4

Wednesday, October 31

Wednesday, October 31 8:30 - 9:20

K3: Keynote speaker 3

Room: Kilden

Wednesday, October 31 9:50 - 11:20

S4.2: Estimation and detection

Data analytics and computation

Room: Kilden

Chair: Igor Melatti (University of Rome "La Sapienza", Italy)

Sparse Bayesian Harmonic State Estimation

Ye Yuan (Huazhong University of Science & Technology, P.R. China); Wei Zhou, Hai-Tao Zhang and Zuwei Ping (Huazhong University of Science and Technology, P.R. China); Omid Ardakanian (University of Alberta, Canada)

Isolation Forest Based Method for Low-Quality Synchrophasor Measurements and Early Events Detection

Tong Wu and Ying Jun (Angela) Zhang (The Chinese University of Hong Kong, Hong Kong); Xiaoying Tang (Ecole Polytechnique Fédérale de Lausanne EPFL, Switzerland)

Deployment Strategies for Crowdsourced Power Outage Detection

Santiago Correa (University of Massachusetts Amherst, USA); Noah Klugman (University of California, Berkeley, USA); Jay Taneja (University of Massachusetts - Amherst, USA)

Performing a Virtual Field Test of a New Monitoring Method for Smart Power Grids

Jan-Hendrik Menke and Florian Schaefer (University of Kassel, Germany); Martin Braun (University of Kassel, Germany and

Fraunhofer IEE, Kassel, Germany)

Data-driven Localization and Estimation of Disturbance in the Interconnected Power System

Hyang-Won Lee (Konkuk University, Korea); Jianan Zhang (Massachusetts Institute of Technology, USA); Eytan Modiano (MIT, USA)

T6.1: Convex relaxations and combinatorial optimization

Room 3

WS6.1: Era of Tactile Internet

WS6 part 1

Room 4

Chair: David Burth Kurka (Imperial College London, United Kingdom (Great Britain))

Towards Emergent Security in Low-Latency Smart Grids with Distributed Control

Marius Stübs (University of Hamburg, Germany)

Deep Q-Learning for Low-Latency Tactile Applications: Microgrid Communications

Medhat Elsayed and Melike Erol-Kantarci (University of Ottawa, Canada)

ARIES: Low Voltage smArt gRid dIcrete Event Simulator to Enable Large Scale Learning in the Power Distribution Networks

Riccardo Bonetto, Ilya Sychev and Oleksandr Zhdanenko (Technische Universität Dresden, Germany); Frank H.P. Fitzek (Technische Universität Dresden & ComNets - Communication Networks Group, Germany)

Power to the Future: Use Cases and Challenges for Mobile, Self Configuring, and Distributed Power Grids

Riccardo Bonetto and Ilya Sychev (Technische Universität Dresden, Germany); Frank H.P. Fitzek (Technische Universität Dresden & ComNets - Communication Networks Group, Germany)

Wednesday, October 31 11:30 - 13:00

S4.3: Data quality, safety and resilience

Data analytics and computation

Room: Kilden

Chair: Omid Ardakanian (University of Alberta, Canada)

Impact of time interval alignment on data quality in electricity grids

Hans-Peter Schwefel (GridData GmbH, Germany, & Aalborg Univ., DK); Imad Antonios (Southern Connecticut State University, USA); Lester Lipsky (U. Connecticut, USA)

Service Abstraction Layer for Building Operating Systems: Enabling portable applications and improving system resilience

Jakob Hviid and Mikkel Kjaergaard (University of Southern Denmark, Denmark)

Parallel Statistical Model Checking for Safety Verification in Smart Grids

Toni Mancini (Università di Roma 1, Italy); Federico Mari and Igor Melatti (University of Rome "La Sapienza", Italy); Ivano Salvo and Enrico Tronci (Sapienza University of Rome, Italy); Jorn Gruber, Barry Hayes and Milan Prodanovic (Institute IMDEA Energy, Spain); Lars Elmegaard (SEAS-NVE, Denmark)

Personalized Feedback-based Customer Incentives in Automated Demand Response

Thanasis G. Papaioannou, George Stamoulis and Marilena Minou (Athens University of Economics and Business, Greece)

Contingency Analysis of Power Systems with Artificial Neural Networks

Florian Schaefer and Jan-Hendrik Menke (University of Kassel, Germany); Martin Braun (Universität Kassel & Fraunhofer

T6.2: Convex relaxations and combinatorial optimization

Room 3

WS6.2: Era of Tactile Internet

WS6 part 2

Room 4

Chair: David Burth Kurka (Imperial College London, United Kingdom (Great Britain))

Wednesday, October 31 14:00 - 15:30

S5.1: Deep Learning and Decision Making for the Smart Grid

Room 4

Chair: Jimmy J Nielsen (Aalborg University, Denmark)

Towards Commoditizing Simulations of System Models Using Recurrent Neural Networks

Ahmet Caner Yüzügüler (Ecole Polytechnique Fédérale de Lausanne, Switzerland); Alexandru Moga and Carsten Franke (ABB Corporate Research, Switzerland)

Residential Load Profile Clustering via Deep Convolutional Autoencoder

Seunghyoung Ryu and Hyungeun Choi (Sogang University, Korea); Hyoseop Lee (Encored Technologies, Korea); Hongseok Kim (Sogang University, Korea); Vincent W.S. Wong (University of British Columbia, Canada)

Application of a Deep Learning Generative Model to Load Disaggregation for Industrial Machinery Power Consumption Monitoring

Pedro Bandeira de Mello Martins (Universidade Federal do Rio de Janeiro & GreenAnt, Brazil); Jose Gabriel Gomes (UFRJ, Brazil); Vagner Barbosa do Nascimento (GreenAnt, Brazil); Antônio de Freitas (Energisa MG, Brazil)

A unified decision making framework for supply and demand management in microgrid networks

Raghuram Bharadwaj D. (Indian Institute of Science, India); Sai Koti Reddy D. (IBM Research - India, India); Krishnasuri Narayanam (IBM, India); Shalabh Bhatnagar (Indian Institute of Science, India)

TH: TechHub

Room: Kilden

WS7.1: AI in Energy Systems

WS7 part 1

Room 3

Reinforcement Learning Control Algorithm for a PV-Battery-System Providing Frequency Containment Reserve Power

Niklas Ebell, Felix Heinrich, Jonas Schlund and Marco Pruckner (University of Erlangen-Nuremberg, Germany)

Day-ahead electricity consumption prediction of a population of households: analyzing different machine learning techniques based on real data from RTE in France

Philipp Theile (RWTH Aachen & KTH Stockholm, Germany); Kaveh Paridari (KTH Royal Institute of Technology, Sweden); Lars M Nordström (Royal Institute of Technology, KTH, Sweden); Anna-Linnea Towle (KTH Royal Institute of Technology, Sweden); Alessandro Crosara, Kaustubh Karnataki and Graham Turk (KTH Stockholm, Sweden)

A Cost-efficient Software Testbed for Cyber-Physical Security in IEC 61850-based Substations

Ghada Elbez (Karlsruhe Institute of Technology (KIT), Germany); Hubert Keller (Karlsruhe Institut of Technology, Germany); Veit Hagenmeyer (Karlsruhe Institute of Technology, Germany)

Wednesday, October 31 16:00 - 17:30

S5.2: Monitoring and Security of the Smart Grid

Room 4

Chair: Daisuke Mashima (Advanced Digital Sciences Center, Singapore)

OpenStack Based Evaluation Framework for Smart Grid Cyber Security

Abdullah Albarakati and Bassam Moussa (Concordia University, Canada); Mourad Debbabi (Concordia University, Montreal, Canada); Amr Youssef (Concordia University, Canada); Basile L Agba and Marthe Kassouf (Hydro Québec Research Institute (IREQ), Canada)

Peer-to-peer Detection of DoS Attacks on City-Scale IoT Mesh Networks

Michael Rausch, Varun Badrinath Krishna and Peng Gu (University of Illinois at Urbana-Champaign, USA); Rupak Chandra (Cisco Systems Inc., USA); Brett Feddersen, Ahmed Fawaz and Bill Sanders (University of Illinois at Urbana-Champaign, USA)

Cable Health Monitoring in Distribution Networks using Power Line Communications

Yinjia Huo, Gautham Prasad, Lutz Lampe and Victor C.M. Leung (University of British Columbia, Canada)

An Anomaly Detection Model for Enhancing Energy Management in Smart Buildings

Muhammad Fahim and Alberto Sillitti (Innopolis University, Russia)

TH: TechHub

Room: Kilden

WS7.2: AI in Energy Systems

WS7 part 2

Room 3

Synchronization Games in P2P Energy Trading

Olga Saukh and Franz Papst (TU Graz / CSH Vienna, Austria); Sergii Saukh (Pukhov Institute of Modelling Problems in Power Engineering, Ukraine)

Online Power Quality Disturbance Classification with Recurrent Neural Network

Dongchan Lee (Massachusetts Institute of Technology, USA); Pirathayini Srikantha (Western University, Canada); Deepa Kundur (University of Toronto, Canada)

Stand-Alone Distributed PV Systems: Maximizing Self Consumption and User Comfort using ANNs

Ashfaq Ahmad and Jamil Y Khan (The University of Newcastle, Australia)

Is Machine Learning in Power Systems Vulnerable?

Yize Chen and Yushi Tan (University of Washington, USA); Deepjyoti Deka (Los Alamos National Lab, USA)

Residential Short-Term Load Forecasting Using Convolutional Neural Networks

Marcus Voß and Christian Bender-Saebelkampf (Technische Universität Berlin (TU Berlin), Germany); Sahin Albayrak (Technische Universität Berlin, Germany)