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Scaling the Peaks of Global Communications

Call for Papers
Symposium on Selected Areas in Communications: Smart Grid Communications Track

Track Chair

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Scope and Motivation

The emerging smart grid integrates numerous distributed elements such as renewable sources, micro grids, energy storage, electrical vehicles and massive sensing and metering infrastructure. To support reliable and timely two-way information and power flow between smart grid elements, novel and evolved information and communication technologies (ICT) are needed. Indeed, smartification of power grid increasingly relies on emerging data-driven machine learning and artificial intelligence technologies based on massive collection of data sets and integration of edge and cloud computing and storage capacities. The data-intensive grid operation will rely on a blend of local field network technologies, wireless access technologies (such as 5G and beyond 5G mobile cellular networks) and wide-area network technologies including power line communications. Such a smart grid network should support a variety of smart grid services, ranging from advanced and near real-time grid protection, network management and state estimation combined with the massive network monitoring and data collection, while including emerging services such as massive machine type communications for advanced metering infrastructure and vehicle-to-grid and grid-to-vehicle communications. The heterogeneous network architecture, components and services typical for power systems makes current ICT solutions hard to accommodate the different communication requirements on bandwidth, latency, reliability and security. Thus, the area of smart grid communications and power line communications represents active area of interdisciplinary research rich in challenging problems concerning the proper design of ICT architecture and signal processing techniques applied to smart grid.

The aim of the track is to bring together researchers from both academia and industry for disseminating cutting-edge research results in theory, application and implementation in the broad areas of smart grid communications and power line communications.

Topics of Interest

The Smart Grid Communications and Power Line Communications Track seeks original contributions in topical areas including but not limited to:

- Cyber-physical modeling and analysis of smart grid
- Integration of renewables, storage units and electric vehicles into smart grid systems
- Security and privacy issues in smart grid and power line communications

- Artificial intelligence and machine learning techniques for smart grid systems
- Demand side management and demand response
- Distributed and autonomous control of micro-grids
- Edge/fog/cloud computing for smart grid systems
- Smart metering technologies for smart grid
- Design of energy markets for smart grids and peer-to-peer trading
- Vehicle-to-grid and grid-to-vehicle communications
- Measurement data, digital twins, experimental testbeds and field trials
- Novel network architectures supporting smart grid communications
- Physical layer solutions and resource allocation in smart grid and power line communications
- Modulation, coding and signal processing for smart grid and power line communications
- Medium access control and routing protocols for smart grid and power line communications
- Communication and signal processing techniques for grid diagnostics and predictive maintenance
- Data acquisition, big data management and analytics for smart grid
- Cross-layer design and optimization methods for smart grid and power line communications
- Wireless power transfer and energy harvesting techniques for smart grid communications
- Economic approaches for improving smart grid efficiency and penetration
- Machine-to-machine communications for smart grid
- Regulation, standardization, and smart grid economics

Important Dates

Paper Submission: 11 October 2023
Notification: 18 January 2024
Camera Ready and Registration: 15 February 2024

How to Submit a Paper

All papers for technical symposium should be submitted via EDAS. Full instructions on how to submit papers are provided on the IEEE ICC 2024 website: https://icc2024.ieee-icc.org/

Journal Publication Opportunity

The authors of selected papers from this symposium will be invited to submit an extended version of their work for fast-track review and possible publication in the IEEE Open Journal of the Communications Society.