

2013 IEEE International Conference on Smart Grid Communications

(SmartGridComm 2013)

**Vancouver, British Columbia, Canada
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Program

Tutorial 1: IEC 61850-Principles, Applications and Benefits

The tutorial will cover briefly the history and fundamental principles of IEC 61850, its applications and benefits. The concepts of abstract models and services and their mapping to specific protocols will be presented. The principles of GOOSE and sampled values, their communication mechanisms, applications and benefits, including their use for synchrophasor communications, will be described. The IEC 61850 configuration language ideas, different files and their application in the engineering of protection and control systems will be discussed. Requirements, methods and tools for the testing of IEC 61850 based systems will be covered at the end.

Workshop 1: Closed-Loop Wide Area Applications, Communications, and Security

Electric power grids worldwide are getting increasingly stressed each year for a number of factors, including renewable integration and inadequate growth in transmission capacity. Further, the lack of adequate visibility has been a major contributing factor in all recent major blackouts. These factors can partially be mitigated by closed-loop applications, including distributed control and system integrity protection schemes (SIPS). These applications by nature have extreme communications requirements -- latency of 1-2 power cycles, extremely high availability, and sometimes a rate of hundreds of Hz -- across hundreds of miles or more.

This industry-focused workshop will help attendees better understand this brave new world that requires different thinking, protocols, etc. The first session will be a panel session on these kinds of applications. The second session will provide an overview of communications issues needed to support this, including an overview of the emerging (but not fully implemented) NASPInet concept as well as a case study with GridStat. The final session will be on the security issues and mechanisms that are required -- naive (but common) applications of existing security mechanisms such as RSA effectively rule out low enough delivery latencies. As a whole, the attendees will get a concrete glimpse into how and why business as usual will not apply to these new and necessary applications.

08:30 - 09:20

Dr. Greg Zweigle, Principal Research Engineer, Schweitzer Engineering Labs Inc.
Applications of Closed-Loop Wide Area Protection and Control

09:20 - 10:00

David Bakken, Professor, Washington State University
Communications for Closed-Loop Cyber Physical WAMPAC

10:10 - 10:30

COFFEE BREAK

10:30 - 11:00

Thoshitha Gamage, Research Assistant Professor, Washington State University
Security Issues and Tradeoffs for Closed-Loop WAN Applications

11:00 - 11:40

John Reynolds, Chief Architect, Security Fabric Alliance.
The Security Fabric for Critical Infrastructures

11:40 - 12:00

Panel, Q&A

Workshop 2: Smart Grid at Scale - The UBC Living Lab

At UBC we view our entire campus as a living laboratory, a "city scale" sand box in which to explore, creatively and collaboratively, solutions to today's challenges and market opportunities. The session will describe the UBC Living Lab initiative and provide details on specific projects supporting the development of integrated smart-grid technology on the campus.

08:30 - 09:00

Iain Evans, Associate Director, Strategic Partnerships UBC
UBC's Living Lab Initiative - Driving Innovation

09:00 - 09:30

Cliff Mui, Director, Product Development, Nexterra Systems Corporation
Carbon-Neutral Community Scale Co-Generation

09:30 - 10:00

Geoff Davenport, President, International Business, Corvus Energy
The role of Energy Storage in the Energy Grid

10:00 - 10:30
COFFEE BREAK

10:30 - 11:00
Victor Goncalves, Director of Engineering, Alpha Technologies
Energy Management

11:00 - 11:30
Guneet Bedi/Robert Flesher, Cisco Systems
Converged Networks- Distributing Power and Data

11:30 - 12:00
David Leboe, Project Manager, Powertech Labs
Integrating Electric Vehicles with the Power Grid

Workshop 3: Joint WWRF/SmartGridComm workshop on Wireless Communications and the Smart Grid

This workshop will discuss both the roles that wireless communications can play in the smart grid of the future, and the use of the smart grid to power future wireless systems including cellular systems and machine-to-machine communications. Speakers will be drawn from both industry and academia, and come from Europe, North America and Asia. Topics covered include the optimal management of energy in a system of cellular base stations, networking issues arising from using wireless sensors and meters in a smart grid, R&D activities within major industry players in this domain, standardization, and more

13.30-14.00 -Fiona Williams, Ericsson:
Smart Energy Field Trials: Insights from a Private Public Partnership and the FINESCE project.

14.00-14.30 -Chuck Adams, Distinguished Standards Strategist, Futurewei Technologies:
IEEE Strategic Smart Grid Standards Infrastructure Development - Integrating Power, Communications, IT, and Applications Requirements

14.30-15.00 -Xavier Costa Perez, Chief Researcher, NEC Europe:
Getting fit for the Smart Grid: Wireless Standardization Efforts

15.00-15.30 -Coffee Break

15.30-16.00 -Martha Russell, Executive Director, mediaX at Stanford University
Sensors, Signals and Sense-Making in Human-Energy Relationships

16.00-16.30 -Teng Joon Lim, National University of Singapore:
Energy Management at Cellular Base Stations in a Smart Grid

16.30-17.00 -Mischa Dohler, King's College London
Shift of Smart Grid Industries

Workshop 4: Smart Grid Cyber Security

Although power utilities across North America operate within their own jurisdictional frameworks, their networks are moving toward a higher level of interconnection as a consequence of the roll out of Smart Grid technologies. As such, attacks on their critical infrastructure may not be contained within jurisdictional borders. Security and resiliency of electrical power infrastructure needs to be ensured through a federally supported coordination, collaboration and standardization program. Issues that need to be thoroughly examined are:

What communication security threats are most critical for electrical utilities?
How vulnerable are existing communication standards and protocols?
Are vendor implementations of these standards truly interoperable?
How willing are vendors to embrace standards and move away from proprietary solutions?
What security best practices exist to help utilities today?
What security technologies are needed in the future?
What role can policy makers play?

Our workshop will discuss these, and other related issues with smart grid cyber security, and provide plenty of time for Q&A.

1:30 - 1:40 - Dr. Hassan Farhangi, Director, BCIT Group for Advanced Information Technology
Welcome and Opening Remarks

1:40 - 2:00 - Bob Lockhart, Research Director, Navigant Research
Smart Grid Communications Security - What Utilities Are Actually Doing

2:00 - 2:20 - Neil Rerup, Enterprise Security Architect, BC Hydro
Cybersecurity Technology Strategy Development for Utilities

2:20 - 2:40 - Patrick C Miller, Managing Partner, The Anfield Group
Securing the Grid - A Discussion on Dependence

2:40 - 3:00 - Justin W Clarke, Principal Consultant, Cyclance
Understanding the Smart Grid Attack Surface - Risks, Hypothetical Attacks, and Protective Countermeasures
3:00 - 3:30 - Coffee Break

3:30 - 3:50 - Frank Turbide, Technical Analyst
Canadian Cyber Incident Response Centre (CCIRC)
Public Safety Canada
Presentation Title: Briefing to Critical Infrastructure Sector Organizations on the CCIRC

3:50 - 5:00 - Panel Discussion, moderated by Dr. Hassan Farhangi

Keynote 1: Networks and Markets for Scheduling Energy Consumption

DEM1: Demand Response and Transportation Electrification

Congestion Management for Urban EV Charging Systems

Emmanouil S. Rigas (Aristotle University of Thessaloniki, Greece); Sarvapali Ramchurn (University of Southampton, United Kingdom); Nick Bassiliades (Aristotle University of Thessaloniki, Greece); George Koutitas (International Hellenic University, Greece)
pp. 121-126

Design of a V2G Aggregator to Optimize PHEV Charging and Frequency Regulation Control

Ran Wang (Nanyang Technological University, Singapore); Yifan Li (Nanyang Technological University, Singapore); Ping Wang (Nanyang Technological University, Singapore); Dusit Niyato (Nanyang Technological University, Singapore)
pp. 127-132

Electric Power Resource Provisioning for Large Scale Public EV Charging Facilities

I. Safak Bayram (North Carolina State University, USA); George Michailidis (University of Michigan, USA); Michael Devetsikiotis (North Carolina State University, USA)
pp. 133-138

Randomized Response Electric Vehicles for Distributed Frequency Control in Smart Grid

Mohammad Reza Vedady Moghadam Nanekaran (National University of Singapore, Singapore); Rui Zhang (National University of Singapore, Singapore); Richard T. B. Ma (National University of Singapore, USA)
pp. 139-144

Analysis of the Behavior of Electric Vehicle Charging Stations with Renewable Generations

Woongsup Lee (Friedrich Alexander University Erlangen Nurnberg, Germany); Lin Xiang (University Erlangen-Nuremberg, Germany); Robert Schober (University of British Columbia, Canada); Vincent W.S. Wong (University of British Columbia, Canada)
pp. 145-150

NET1: Access Network Performance

Novel Coexistence Scheme between Wireless Sensor Network and Wireless LAN for HEMS

Fumihito Inoue (Kyoto University, Japan); Masahiro Morikura (Kyoto University, Japan); Takayuki Nishio (Kyoto University, Japan); Koji Yamamoto (Kyoto University, Japan); Fusao Nuno (NTT, Japan); Takatoshi Sugiyama (NTT, Japan)
pp. 271-276

Dynamic Selection of Wireless/Powerline Links using Markov Decision Processes

Dacfez Dzung (ABB Switzerland Ltd. & Corporate Research, Switzerland); Yvonne-Anne Pignolet (ABB Corporate Research, Dättwil, Switzerland)
pp. 277-282

Pilot Based Channel Estimation and Transform Domain Analysis in Broadband PLC for Smart Grid

Muharrem A Tunç (University of Kansas, USA); Erik S. Perrins (University of Kansas, USA)
pp. 283-288

Feedback Control Scheme with Prediction for Power Line Communication Channels

Cesar Carrizo (Nagoya University, Japan); Kentaro Kobayashi (Nagoya University, Japan); Hiraku Okada (Nagoya University, Japan); Masaaki Katayama (Nagoya University, Japan)
pp. 289-293

Performance Evaluation of PRIME in Smart Grid

Mehdi Korki (Swinburne university of Technology, Australia); Cishen Zhang (Swinburne University of Technology, Australia); Hai L. Vu (Swinburne University of Technology, Australia)
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STO1: Support for Storage, Renewable Resources and Micro-grids I

Optimal Energy Storage Management in DC Power Networks

Akira Ito (DENSO, Japan); Toru Shiraki (Denso CO., LTD, Japan)
pp. 630-635

Low-Rank Solution of Convex Relaxation for Optimal Power Flow Problem

Somayeh Sojoudi (California Institute of Technology, USA); Ramtin Madani (Columbia University, USA); Javad Lavaei (Columbia University, USA)
pp. 636-641

Convex Relaxation and Decomposition in Large Resistive Power Networks with Energy Storage

Xin Lou (City University of Hong Kong, Hong Kong); Chee Wei Tan (City University of Hong Kong, Hong Kong)
pp. 642-647

Optimal Storage-Aided Wind Generation Integration Considering Ramping Requirements

Lin Xiang (University Erlangen-Nuremberg, Germany); Derrick Wing Kwan Ng (University Erlangen-Nürnberg, Germany); Woongsup Lee (Friedrich Alexander University Erlangen Nurnberg, Germany); Robert Schober (University of British Columbia, Canada)
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Robust Optimal Power Flow with Wind Integration Using Conditional Value-at-Risk

Yu Zhang (University of Minnesota, USA); Georgios B. Giannakis (University of Minnesota, USA)
pp. 654-659

DEM2: Pricing for Demand Response

Convex Hull Pricing for Demand Response in Electricity Markets

Naoki Ito (Keio University, Japan); Akiko Takeda (The University of Tokyo, Japan); Toru Namerikawa (Keio University, Japan)
pp. 151-156

Optimal Battery Configuration in a Residential Home with Time-of-Use Pricing

Baris Aksanli (UCSD, USA); Tajana Simunic Rosing (UCSD, USA)
pp. 157-162

Dynamic Price Optimization Models for Managing Time-of-Day Electricity Usage

Shivaram Subramanian (IBM Research, USA); Soumyadip Ghosh (IBM T.J. Watson Research Center, USA); Jonathan Hosking (IBM Research, USA); Ramesh Natarajan (IBM TJ Watson, USA); Xiaoxuan Zhang (IBM Research, USA)
pp. 163-168

Low-Frequency Power-Grid Ancillary Services From Commercial Building HVAC Systems

Yashen Lin (University of Florida, USA); Prabir Barooah (Univ of Florida, USA); Sean Meyn (University of Florida, USA)
pp. 169-174

Online Speeding Optimal Charging Algorithm for Electric Vehicles without Future Information

Wanrong Tang (The Chinese University of Hong Kong, Hong Kong); Suzhi Bi (The Chinese University of Hong Kong, Hong Kong); Ying Jun (Angela) Zhang (The Chinese University of Hong Kong, Hong Kong)
pp. 175-180

SEC1: Data Integrity

Detection and Localization of Targeted Attacks on Fully Distributed Power System State Estimation

Ognjen Vuković (KTH, Royal Institute of Technology, Sweden); György Dán (KTH, Royal Institute of Technology, Sweden)
pp. 390-395

On Phasor Measurement Unit Placement against State and Topology Attacks

Jinsub Kim (Cornell University, USA); Lang Tong (Cornell University, USA)
pp. 396-401

Malicious Data Detection in State Estimation Leveraging System Losses & Estimation of Perturbed Parameters

William Niemira (University of Illinois Urbana-Champaign, USA); Rakesh B. Bobba (University of Illinois at Urbana-Champaign, USA); Peter Sauer (University of Illinois at Urbana-Champaign, USA); Bill Sanders (University of Illinois at Urbana-Champaign, USA)
pp. 402-407

Detecting False Data Injection in Smart Grid In-Network Aggregation

Lei Yang (The University of Kansas, USA); Fengjun Li (University of Kansas, USA)
pp. 408-413

A Formal Model for Verifying Stealthy Attacks on State Estimation in Power Grids

Mohammad Ashiqur Rahman (University of North Carolina at Charlotte, USA); Ehab Al-Shaer (University of North Carolina Charlotte, USA); Md Rahman (Virginia Polytechnique Institute and State University, USA)
pp. 414-419

STO2: Support for Storage, Renewable Resources and Micro-grids II

Dynamic Contract to Regulate Energy Management in Microgrids

Lingjie Duan (Singapore University of Technology and Design (SUTD), Singapore); Rui Zhang (National University of Singapore, Singapore)
pp. 660-665

ECO-DAC Energy Control Over Divide and Control

Alper Sinan Akyurek (University of California - San Diego, USA); Bill Torre (University of California - San Diego, USA); Tajana Simunic Rosing (UCSD, USA)
pp. 666-671

Stability, Power Sharing, & Distributed Secondary Control in Droop-Controlled Microgrids

John Simpson-Porco (University of California, Santa Barbara, USA); Florian Dörfler (University of California Santa Barbara & Center for Control, Dynamical Systems and Computation, USA); Qobad Shafiee (Aalborg University, Denmark); Josep M. Guerrero (Aalborg University, Denmark); Francesco Bullo (UCSB, USA)
pp. 672-677

Optimal Energy Management for Cooperative Microgrids With Renewable Energy Resources

Duong Nguyen (INRS, University of Quebec, Canada); Long Bao Le (INRS, University of Quebec, Canada)
pp. 678-683

Scalable Model Predictive Control of Demand For Ancillary Services

Mahnoosh Alizadeh (University of California, Davis, USA); Anna Scaglione (University of California, Davis, USA); George Kesidis (Pennsylvania State University, USA)
pp. 684-689

ARCH1: Architectures and Models for the Smart Grid I

Management of a Smart Grid with Controlled-Delivery of Discrete Power Levels

Roberto Rojas-Cessa (New Jersey Institute of Technology, USA); Yifei Xu (New Jersey Institute of Technology, USA); Haim Grebel (New Jersey Institute of Technology, USA)
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Voltage-based clustering to identify connectivity relationships in distribution networks

Vijay Arya (IBM Research - India, India); Rajendu Mitra (IBM Research - India, India)
pp. 7-12

Distributed Regulation Allocation with Aggregator Coordinated Electric Vehicles

Sun Sun (University of Toronto, Canada); Min Dong (University of Ontario Institute of Technology, Canada); Ben Liang (University of Toronto, Canada)
pp. 13-18

Distributed Mode Scheduling for Coordinated Power Balancing

Hiroaki Kawashima (Kyoto University, Japan); Takekazu Kato (Kyoto University, Japan); Takashi Matsuyama (Kyoto University, Japan)
pp. 19-24

Double-Layered Control Methodology Combining Price Objective and Grid Constraints

Sandro Iacovella (KU Leuven, Belgium); Frederik Geth (KULeuven ESAT-ELECTA, Belgium); Frederik Ruelens (KU Leuven, Belgium); Niels Leemput (KULeuven ESAT-ELECTA, Belgium); Pieter Vingerhoets (KU Leuven, Belgium); Bert Claessens (VITO, Belgium); Geert Deconinck (KU Leuven, Belgium)
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NET2: Smart Grid Data Management

Coral: Reliable and Low-latency P2P Convergecast for Critical Sensor Data Collection

Daniel Germanus (Technical University of Darmstadt, Germany); Abdelmajid Khelil (Huawei European Research Center, Germany); Johannes Schwandke (TU Darmstadt, Germany); Neeraj Suri (Technical University of Darmstadt, Germany)
pp. 300-305

Analyzing Storage Requirements of the Resilient Information-Centric SeDAX Architecture

Michael J Hoefling (University of Tuebingen, Germany); Cynthia Mills (University of Tuebingen, Germany); Michael Menth (University of Tuebingen, Germany)
pp. 306-311

Utilizing a Flexibility Interface for Distributed Energy Resources Through a Cloud-Based Service

Lasse Orda (Technical University of Denmark, Denmark); Jesper Bach (Technical University of Denmark, Denmark); Anders Bro Pedersen (Technical University of Denmark, Denmark); Bjarne Poulsen (, Denmark); Lars Hansen (DONG Energy, Denmark)
pp. 312-317

On the Scalable Collection of Metering Data in Smart Grids through Message Concatenation

Babak Karimi (Wichita State University, USA); Vinod Namboodiri (Wichita State University, USA); Murtuza Jadhliwala (Wichita State University, USA)
pp. 318-323

Characteristics of AMI using DLMS/COSEM and IEEE 802.15.4g Multi-hop Wireless Communication

Tetsuo Otani (Central Research Institute of Electric Power Industry, Japan); Michifumi Miyashita (Central Research Institute of Electric Power Industry, Japan)
pp. 324-329

STAN1: Simulation and Co-simulation

MAC-Sim: A Multi-Agent and Communication Network Simulation Platform for Smart Grid Applications Based on Established Technologies

Fidelis Perkonigg (Imperial College London, United Kingdom); Djordje Brujic (Imperial College London, United Kingdom); Mike Ristic (Imperial College London, United Kingdom)
pp. 570-575

INSPIRE: Integrated Co-Simulation of Power and ICT Systems for Real-Time Evaluation

Hanno Georg (TU Dortmund University, Germany); Sven Christian Müller (TU Dortmund, Germany); Nils Dorsch (TU Dortmund University, Germany); Christian Rehtanz (University of Dortmund, Germany); Christian Wietfeld (TU Dortmund University & Communication Networks Institute, Germany)
pp. 576-581

A Tool for Assessing Interdependency of Mobile Communication And Electricity Distribution Networks

Seppo Horsmanheimo (VTT Technical Research Centre of Finland, Finland); Niwas Maskey (Aalto University, Finland); Heli Kokkoniemi-Tarkkanen (VTT Technical Research Centre of Finland, European Union); Pekka Savolainen (VTT Technical Research Centre of Finland, Finland); Lotta Tuomimäki (VTT Technical Research Centre of Finland, Finland)
pp. 582-587

A Control Loop Approach for Integrating The Future Decentralized Power Markets and Grids

Yong Ding (Karlsruhe Institute of Technology, Germany); Per Goncalves da Silva (SAP, Germany); Martin A. Neumann (Karlsruhe Institut of Technology (KIT), Germany); Lin Zhang (Tsinghua University, P.R. China); Michael Beigl (KIT & TecO, Germany); Matthias Budde (Karlsruhe Institute of Technology, Germany)
pp. 588-593

The Development of a Smart Grid Co-Simulation Platform and Case Study on Vehicle-To-Grid Voltage Support Application

Chong Shum (City University of Hong Kong, Hong Kong); Wing-Hong Lau (City University of Hong Kong, Hong Kong); Ka Lun Lam (City University of Hong Kong, Hong Kong); Yuxuan He (City University of Hong Kong, Hong Kong); Shu-hung Chung (City University of Hong Kong, Hong Kong); Norman Tse (City University of Hong Kong, Hong Kong); Kim Fung Tsang (City University of Hong Kong, Hong Kong); Loi Lei Lai (City University. London, United Kingdom)
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Keynote 2: Transforming Our Business with Technology

ARCH2: Architectures and Models for the Smart Grid II

Impact Study of Collaborative Implementation Models on Total Cost of Ownership of Integrated Fiber-Wireless Smart Grid Communications Infrastructures

Ramzi Charni (INRS-EMT, Canada); Martin Maier (Institut National de la Recherche Scientifique (INRS), Canada)
pp. 31-36

Fair Power Allocation in Multi-User Systems with Controllable Loads

Maja Etinski (NEC Laboratories Europe, Germany); Anett Schülke (NEC Laboratories Europe, Germany)
pp. 37-42

Online Scheduling for Vehicle-to-Grid Regulation Service

Junhao Lin (The University of Hong Kong, Hong Kong); Ka-Cheong Leung (The University of Hong Kong, Hong Kong); Victor O. K. Li (University of Hong Kong, P.R. China)
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A Comparative Study of High Renewables Penetration Electricity Grids

Jay Taneja (University of California at Berkeley, USA); Virginia Smith (University of California, Berkeley, USA); David Culler (University of California at Berkeley, USA); Catherine Rosenberg (University of Waterloo, Canada)

Impact Analysis of Locational Marginal Price Subject to Power System Topology Errors

Dae-Hyun Choi (Texas A&M University, USA); Le Xie (Texas A&M University, USA)

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NET3: Grid Detection and Estimation

Wireless Communication Aided Differential Relay Protection in Smart Grids: A Concerted Blitzkrieg

Zhenghao Zhang (The University of Tennessee & University of Tennessee, USA); Husheng Li (University of Tennessee, USA); Ju Bin Song (Kyung Hee University, Korea); Zhu Han (University of Houston, USA); Gaoyong Luo (Guangzhou University, P.R. China); Wenjing Hu (Shandong University, USA)

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Power Grid Topology Inference Using Power Line Communications

Lutz Lampe (University of British Columbia, Canada); Mohamed Osama Ahmed (University of British Columbia, Canada)

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PMU Placement for Optimal Three-Phase State Estimation Performance

Yue Yang (University of Washington, USA); Sumit Roy (University of Washington, USA)

pp. 342-347

Fuzzy C-Means Algorithm for Parameter Estimation of Partitioned Markov Chain Impulsive Noise Model

Fabien Sacuto (McGill University, Canada); Fabrice Labeau (McGill University, Canada); Basile Landaabalo Agba (Institut de Recherche d'Hydro-Québec & École de technologie supérieure, Canada)

pp. 348-353

A Maximum-Entropy Based Fast Estimation of Power Quality for Smart Microgrid

Sardar Ali (University of Victoria, Canada); Kui Wu (University of Victoria, Canada); Dimitri Marinakis (University of Victoria, Canada)

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STAN2: Testbeds and Field Trials

Unify AMI Information Models to Support Diversified Smart Grid Systems and Applications

Zhao Li (ABB US Corporate Research Center, USA); Jiang Zheng (ABB US Corporate Research Center, USA)

pp. 600-605

An On-line PLC Frequency Impedance Analyzer

Cornelis J. Kikkert (James Cook University, Australia)

pp. 606-611

Domino of the Smart Grid: An Empirical Study of System Behaviors in the Interdependent Network Architecture

Xiang Lu (Institute of Information Engineering, CAS, P.R. China); Wenye Wang (NC State University, USA); Jianfeng Ma (Xidian University, P.R. China); Limin Sun (Institute of Information Engineering, China Academy of Science, Beijing, P.R. China)

pp. 612-617

Randomizing AMI Configuration for Proactive Defense in Smart Grid

Muhammad Qasim Ali (University of North Carolina Charlotte, USA); Ehab Al-Shaer (University of North Carolina Charlotte, USA); Qi Duan (UNCC, USA)

pp. 618-623

Realistic Model for Narrowband PLC for Advanced Metering Infrastructure

Tanguy Ropitault (Telecom Bretagne, France); Alejandro Lampropoulos (Institut TELECOM / TELECOM Bretagne, France); Alexander Pelov (Institut Mines-Telecom / Telecom Bretagne,

France); Ramanuja Vedantham (Texas Instruments Inc., USA); Philippe Chiumminto (ITRON, France); Laurent Toutain (Telecom Bretagne, France)
pp. 624-629

Lightning talks session

Panel discussion: BC Hydro's Experience and Challenges with Smart Grid

Utilities world-wide are looking to implement smartgrid technologies to help meet business objectives due to drivers such as aging infrastructures, workforce and capital resource constraints, rate pressures, elevated customer expectations, policy requirements, and the need to manage disruptive technologies. Although smartgrid technologies promise a host of benefits, including improvements in efficiency, reliability, and safety, they are often transformational and represent significant challenges to the traditional utilities. This panel will discuss, from BC Hydro's perspective, real-life experiences and challenges associated with planning, implementing, and operating systems that incorporate these new technologies.

BC Hydro is a Crown Corporation providing electricity to 95% of British Columbia residents. BC Hydro is committed to energy conservation, reduction of green house gases, and modernization of the electrical grid while keeping the lights on and the rates low for customers.

Participants:

Sol Lancashire, Chief Telecom Architect, Chair
Al Mithani, Project Manager Distribution Management System
Vern Kwiatkowski, IT Manager Smart Metering Infrastructure
Adam French, Manager Telecommunications

DEM3: Demand Response Communications and Networking

Enabling Demand Response in a Computer Cluster

Chen Wang (CSIRO ICT Centre, Australia); Martin de Groot (CSIRO ICT Center, Australia)
pp. 181-186

LTE and Hybrid Sensor-LTE Network performances in Smart Grid Demand Response Scenarios

Juho Markkula (Centre for Wireless Communications, University of Oulu, Finland); Jussi P Haapola (Centre for Wireless Communications, University of Oulu, Finland)
pp. 187-192

Ambient Sensing-based Incentives for Behavior Modification in Demand Response

Chen-Khong Tham (National University of Singapore, Singapore); Chongyu Zhou (National University of Singapore, Singapore)
pp. 193-198

Online Energy Management Strategies for Base Stations Powered by the Smart Grid

Johann Leithon (National University of Singapore, Singapore); Teng Joon Lim (National University of Singapore, Singapore); Sumei Sun (Institute for Infocomm Research, Singapore)
pp. 199-204

An Adaptive Scheduling of PHEV Charging: Analysis under Imperfect Data Communication

Qiumin Dong (Nanyang Technological University, Singapore); Dusit Niyato (Nanyang Technological University, Singapore); Ping Wang (Nanyang Technological University, Singapore); Zhu Han (University of Houston, USA)
pp. 205-210

SEC2: Privacy, Confidentiality and Authentication

Privacy-Friendly Appliance Load Scheduling in Smart Grids

Cristina E.M. Rottondi (Politecnico di Milano, Italy); Giacomo Verticale (Politecnico di Milano, Italy)
pp. 420-425

Smart Meter Speed Dating, short-term relationships for improved privacy in Smart Metering

Sören Finster (Karlsruhe Institute of Technology (KIT), Germany)
pp. 426-431

Confidentiality-preserving Obfuscation for Cloud-based Power System Contingency Analysis

Ognjen Vuković (KTH, Royal Institute of Technology, Sweden); György Dán (KTH, Royal Institute of Technology, Sweden); Rakesh B. Bobba (University of Illinois at Urbana-Champaign, USA)
pp. 432-437

Spoofing Prevention Using Received Signal Strength for ZigBee-Based Home Area Networks

Paria Jokar (University of British Columbia, Canada); Nasim Arianpoo (University of British Columbia, Canada); Victor CM Leung (The University of British Columbia, Canada)
pp. 438-443

TSAF: Tamper-resistant and Scalable Mutual Authentication Framework for Plug-in EV Charging

Young Jin Kim (Bell Labs, Alcatel-Lucent, USA); Vladimir Kolesnikov (Bell Labs, USA); Marina Thottan (Bell Labs, USA)
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STO3: Testbeds II & Support for Storage, Renewable Resources and Micro-grids |||

A High Performance Line Filter for Narrowband Power Line Communication Testbed Applications

Steffen Mueller (University of Erlangen-Nuremberg, Germany); Robert Weigel (University of Erlangen-Nuremberg, Germany); Fabian Lurz (University of Erlangen-Nuremberg, Germany); Alexander Koelpin (University of Erlangen-Nuremberg & Institute f. Electronics Engineering, Germany)
pp. 690-695

Cloud Motion Estimation for Short Term Solar Irradiation Prediction

Hao Huang (Stony Brook University & Brookhaven National Lab, USA); Jin Xu (Stony Brook University, USA); Zhenzhou Peng (Stony Brook University, USA); Shinjae Yoo (Brookhaven National Lab, USA); Dantong Yu (BNL, Upton, USA); Dong Huang (Brookhaven National Lab, USA); Hong Qin (Stony Brook University, USA)
pp. 696-701

Modeling the Effect of Geographically Diverse PV Generation on California's Distribution System

Michael Cohen (University of California, Berkeley, USA); Duncan Callaway (UC Berkeley, USA)
pp. 702-707

Solar Irradiance Forecast System Based on Geostationary Satellite

Zhenzhou Peng (Stony Brook University, USA); Shinjae Yoo (Brookhaven National Lab, USA); Dantong Yu (BNL, Upton, USA); Dong Huang (Brookhaven National Lab, USA)
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Value of Aggregation in a Smart Grids

Raffi Sevljan (Stanford University, USA); Ram Rajagopal (University of California, Berkeley, USA)
pp. 714-719

CYB1: Cyber-Physical Wide-Area Monitoring, Protection & Control - I

SeCPSim: A Training Simulator for Cyber-Power Infrastructure Security

Ceeman Vellaithurai (Washington State University, USA); Anurag Srivastava (Washington State University, USA); Saman Zonouz (University of Miami, USA)
pp. 61-66

Structural Dependability Analysis in Smart Grid under Simultaneous Failures

Jonas Wäfler (Norwegian University of Science and Technology, Norway); Poul E. Heegaard (Norwegian University of Science and Technology & NTNU, Norway)
pp. 67-72

Detection, Recognition, and Localization of Multiple Attacks through Event Unmixing

Wei Wang (University of Tennessee, USA); Li He (University of Tennessee, Knoxville, USA); Penn Markham (University of Tennessee, USA); Hairong Qi (the University of Tennessee, USA); Yilu Liu (University of Tennessee, USA)
pp. 73-78

On Measurement Unit Placement for Smart Electrical Grid Fault Localization

Md Mashud Hyder (The University of Newcastle, Australia); Kaushik Mahata (University of New Castle, Australia)
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Dynamic Modeling and Resilience for Power Distribution

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