

# **2016 2nd International Conference on Intelligent Green Building and Smart Grid (IGBSG 2016)**

**Prague, Czech Republic  
27-29 June 2016**



**IEEE Catalog Number: CFP16IGB-POD  
ISBN: 978-1-4673-8256-4**

**Copyright © 2016 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 publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

|                         |                   |
|-------------------------|-------------------|
| IEEE Catalog Number:    | CFP16IGB-POD      |
| ISBN (Print-On-Demand): | 978-1-4673-8256-4 |
| ISBN (Online):          | 978-1-4673-8473-5 |

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## Table of Contents

|                                                                                                                                                                                           |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Yu-Min Lin, Hung-Chi Kuo, An-Yeu Wu: Robust LMS-based Compressive Sensing Reconstruction Algorithm for Noisy Wireless Sensor Networks .....                                               | 1   |
| Wei-Lun Hsiao, Wei-Yu Chiu: Spectrum Sensing Control for Enabling Cognitive Radio Based Smart Grid .....                                                                                  | 6   |
| Ondrej Vondrous, Peter Macejko, Tomas Hegr, Zbynek Kocur: Testing Methodology for Performance Evaluation of Communication Systems for Smart Grid .....                                    | 12  |
| Ondrej Tomanek, Lukas Kencl: Security and Privacy of Using AllJoyn IoT Framework at Home and Beyond .....                                                                                 | 18  |
| Zhi-Yu Yang, Shin-Ming Cheng, Yueh Jir Wang: Mode Selection for Device-to-Device Communications with Voronoi Tessellation.....                                                            | 24  |
| Jaromir Hrad, Jiri Vodrazka: On Specific Problems Related to Communication over Middle-Voltage Distribution Lines .....                                                                   | 30  |
| Takafumi Katayama, Tian Song, Wen Shi, Takashi Shimamoto, Jenq-Shiou Leu: Reference Frame Selection Algorithm of HEVC Encoder for Low Power Video Device .....                            | 34  |
| Nader Mohamed, Sanja Lazarova-Molnar, Jameela Al-Jaroodi: SBDaaS: Smart Building Diagnostics as a Service on the Cloud.....                                                               | 40  |
| Steven Hipwell, Matt Majedi, Extracting business-intelligence from integrated building and environmental systems: a working model .....                                                   | 46  |
| Tsung-Han Tsai, Chih-Hao Chang, Shih-Wei Chen: Vision Based Indoor Positioning for Intelligent Buildings .....                                                                            | 50  |
| Yu Chen Lin, Guan You Lin, Yuan-Hsiang Lin: Development of a FPGA-Based Contactless Pulse Rate Detection System.....                                                                      | 54  |
| Jung-Te Huang, Shanq-Jang Ruan, Jong-Woei Whang: Intelligent Natural Light Illumination System .....                                                                                      | 59  |
| Chih Hao Chen, Tseung-Yuen Tseng, Chung Jung Hung: Fabrication of Flexible Electrochromic Devices Based on Tungsten Trioxide Nanobundles .....                                            | 65  |
| Agne Toleikyte, Raphael Bointner: Energy Efficient Design in Shopping Centres - a Pathway Towards Lower Energy Consumption .....                                                          | 71  |
| Raphael Bointner, Agne Toleikyte, Lukas Kranzl: Cross-country Analysis of the Implementation of Nearly Zero-energy Building Standards Across Europe .....                                 | 76  |
| Jaroslav Knappek, Reinhard Haas: New Challenges in RES support.....                                                                                                                       | 82  |
| Jiří Vecka: Model of Medium-sized District Heating Development Strategy Based on New Environmental Legislation .....                                                                      | 86  |
| Július Bemš, Tomáš Králík, Jaroslav Knappek, Anna Kradeckaia: Bidding Zones Reconfiguration – Current Issues .....                                                                        | 92  |
| Han-Wen Liang, Chih-Hsiang Ho, Li-Sheng Chen, Wei-Ho Chung, Shih-Yi Yuan, Sy-Yen Kuo: Coverage Hole Detection in Cellular Networks with Deterministic Propagation Model .....             | 98  |
| Walaa Younes Al Smadi, San-Liang Lee, Puspa Devi Pukhrambam, Kuo Chang Feng: Converging Optical Access with Energy Management Networks to Provide Bidirectional Services.....             | 104 |
| Chia-Hui Wang, Chen-Kuei Yang, Wei-Chih Liao, Ray-I Chang, Tsao-Ta Wei: Coupling GPU and MPTCP to Improve Hadoop/MapReduce Performance .....                                              | 109 |
| Wu-Hsiao Hsu, Xing-Hua Wang, Sheng-Cheng Yeh, Ping-Sheng Huang: The Implementation of a QoS/QoE Mapping and Adjusting Application in Software-Defined Networks.....                       | 115 |
| Jeng-Sheng Yeh, Cheng-Chi Chang, Tsorng-Lin Chia, Shu-Yin Chiang, Ping-Sheng Huang: Cooperative Dual Camera Surveillance System for Real-Time Object Searching and Close-Up Viewing ..... | 119 |
| Chun-Yao Liu, Yi-Siang Chen, Jenq-Shiou Leu, Tian Song: Energy Efficient Streaming for Smartphones by Video Adaptation and Backlight Control .....                                        | 124 |

|                                                                                                                                                                                                     |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Tso-I Lai, Wen-Hsien Fang, Shih-Chun Lin: Efficient Subcarrier Pairing and Power Allocation in Multi-Relay Cognitive Networks .....                                                                 | 129 |
| Shiann-Tsong Sheu, Ray-Guang Cheng, Jie-Yu Wang, Kai-Hua Kuo, Ruki Harwahu: Performance Analysis of the Window-based HARQ Time Bundling Scheme.....                                                 | 134 |
| Ying-Chun Chuang, Hung-Shiang Chuang, Chun-Hsiang Yang, Yung-Shan Wang: A Novel Current-Fed Parallel-Loaded Resonant Converter with ZVS for Low-Power Energy Conversion .....                       | 140 |
| Poki Chen, Ya-Yun Hsiao, Yi-Su Chung: A High Resolution FPGA TDC Converter with 2.5 ps Bin Size and -3.79~6.53 LSB Integral Nonlinearity .....                                                      | 146 |
| Kittisak Phaebua, Titipong Lertwiriaprapa, Suramate Chalermwisutkul, Prayoot Akkaraekthalin: Area Extension of a Wireless Battery Charging System using Multiple Power Repeater Coil Antennas ..... | 151 |
| Lih-Yih Chiou, Wei-Jhe Lin, Chi-Ray Huang, Sheng-Kai Lo: Design of A 0.3V-1.2V Wide Input Range Solar Energy Harvesting Circuit with High Converting Power Efficiency .....                         | 155 |
| Chia-Lun Chang, Tai-Cheng Lee: An Thermoelectric and RF Multi-Source Energy Harvesting System.....                                                                                                  | 160 |
| TingSheng Chen, Ding-Yuan Lee, Tsung-Te Liu, An-Yeu Wu: Filter-Based Dual-Voltage Architecture for Low-Power Long-Word TCAM Design .....                                                            | 165 |
| Rodrigo Oliveira, Guilherme Flores, Bruno Biaz, Vitor Hugo Ferreira, Natalia Fernandes, Márcio Z. Fortes: Electronic Metering in Brazil: A Qualitative Analysis for its Evolution.....              | 170 |
| Heng-Ming Hsu, Wei-En Chang: High Conversion Gain Receiver for Wireless Sensor Network.....                                                                                                         | 176 |
| Zdenek Muller, Josef Tlustý, Viktor Valouch: Control of Flying Capacitor Multilevel Converter in Fault State after Grid Disturbance .....                                                           | 180 |
| Georgios Tsousoglou, Prodromos Makris, Emmanouel Varvarigos: Micro Grid Scheduling Policies, Forecasting Errors, and Cooperation Based on Production Correlation.....                               | 186 |
| Ming-Yuan Cho, Shih-Yun Lin, Chien-Hsing Li, Chien-Nan Chen, Hsin-Yi Huang: Development and Implementation of Energy Controller with Open Automated Demand .....                                    | N/A |
| Kálmán Tornai, Andras Olah, Máté Lőrincz: Forecast Based Classification for Power Consumption Data .....                                                                                            | 197 |
| Waltenegus Dargie, Omar Alfandi, Mohamad Badra: Dynamic and Efficient Brokering of Energy Suppliers and Consumers in a Smart Grid.....                                                              | 202 |
| Shunsuke Kawano, Shinya Yoshizawa, Yasuhiro Hayashi: Method for Enumerating Feasible LDC Parameters for OLTC and SVR in Distribution Networks .....                                                 | 207 |
| Famous Igbinoia, Ghaeth Fandi, Zdenek Muller, Jan Svec, Josef Tlustý: Cost Implication and Reactive Power Generating Potential of the Synchronous Condenser .....                                   | 212 |
| Elizabeth Harrison, David Saad, K. Y. Michael Wong: Message Passing for Distributed Optimisation of Power Allocation with Renewable Resources.....                                                  | 218 |
| Jeeng-Min Ling, Ping Hsun Liu: Planning of Household Renewable Generation for Improved Energy Utilization in MicroGrids .....                                                                       | 224 |
| Shan Zhang, Xiaoshan Sun, Hengchang Liu: Combining Data Centers with Electric Vehicle Battery Swapping Stations for Grid Regulation .....                                                           | 229 |
| Bor-Ren Lin, Sheng-Zhi Zhang: Implementation of a Modular Full-Bridge DC/DC Converter .....                                                                                                         | 235 |
| Bor-Ren Lin, Jheng-Jie Dai, Y. K. Du: Analysis of a New Resonant Converter with Auxiliary Windings to Extend Input Voltage Range.....                                                               | 241 |