

# **2020 4th International Conference on Smart Grid and Smart Cities (ICSGSC 2020)**

**Osaka, Japan  
18 – 21 August 2020**



IEEE Catalog Number: CFP20URA-POD  
ISBN: 978-1-7281-9405-9

**Copyright © 2020 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:	CFP20URA-POD
ISBN (Print-On-Demand):	978-1-7281-9405-9
ISBN (Online):	978-1-7281-9404-2

**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)

# Table of Contents

## The 4th International Conference on Smart Grid and Smart Cities (ICSGSC 2020)

Preface.....	vi
Conference Committees.....	vii

---

### Power and Energy Engineering

Research on Non-Intrusive Load Monitoring Based on Random Forest Algorithm.....	1
<i>Wu Guohua, Yuan Diping, Yin Jiayao, Zeng Wenhua, Deng Peng, Xiao Yiqing</i>	
Dynamic Modeling and Simulation of the Large-scale Regional Integrated Electricity and Natural Gas System ..	
.....	6
<i>Yan Siyun, Li Taotao, Huang Di, Zhang Chenyu, Hao Jiarui, Zhou Dengji</i>	
Battery Degradation Platform and Model for Realistic Battery Use Cases.....	14
<i>Daisuke Kodaira and Sekyung Han</i>	
Short-term Load Prediction Based on User Behaviors Anal .....	18
<i>Li Huang, Gan Zhou, Jie Li, Shihai Yang</i>	
Comparison in Power-Forecasting Methods for Geographically Distributed PV Power Systems Using Their Previous Datasets.....	24
<i>Taiki Kure, Yosui Miyazaki, Junji Kondoh, Yusuke Kameda</i>	
Reinforcement Learning Methods on Optimization Problems of Natural Gas Pipeline Networks .....	29
<i>Dong Yang, Siyun Yan, Dengji Zhou, Tiemin Shao, Lin Zhang, Tongsheng Xing</i>	
A Decision Support Tool for Optimal Charging Scheduling for Individual Electric Vehicle Users .....	35
<i>In-chan Kim, Aruna Sivarkumar, Nicolò Daina</i>	
Influence of Voltage Measurement Accuracy on the Impedance Estimation by a Power Conditioning System.....	
.....	44
<i>Shunsuke Tamura, Junji Kondoh, Yuta Kushida</i>	

System Simulation and Comparative Study on Operating Strategies for Regional Integrated Energy Systems .....	50
<i>Taotao Li, Siyun Yan, Di Huang, Chenyu Zhang, Dawen Huang, Dengji Zhou</i>	
Numerical Model of the External Thermal Resistance of Underground Cables Buried in the Multi-layers Soil for Ampacity Calculation.....	57
<i>Nguyen Ngoc Khoa</i>	
<b>Power Grid Fault Location and Analysis</b>	
Method for Power Grid Fault Identification and Cause Analysis Considering Environmental Information .....	64
<i>Haohui Su, Qi Wang, Yanzhou Chen, Weidong Xu, Xinyu Chen</i>	
Power Communication Network Fault Recovery Algorithm Based on Service Characteristics and Node Reliability .....	71
<i>Lijing Yan, Fangfang Dang, Dingding Li, Gangyi Yue</i>	
Research on Fuzzy Droop Control of DC Microgrid Based on Consensus Algorithm.....	76
<i>Haifeng Liang, Jinrui Ding, Ji Bian, Zixing Liu</i>	
Fault Location Algorithm for Power Grid Based on Protection Status Infor-mation and Aggregation Hierarchical Clustering .....	83
<i>Qi Wang, Haohui Su, Yanzhou Chen, Xinyu Chen, Weidong Xu</i>	
<b>Computer Network and Information Engineering</b>	
Distributed Edge Computing Resource Allocation Algorithm Based on DRL in LTE Access Network .....	88
<i>Huan Li, Gang Wang, Yang Liu, Shuai Ren, Tong Li, Dongdong Wang</i>	
A Multi-Subject Two-Level Game Strategy Based on Incremental Distribution Network in China .....	95
<i>Haifeng Liang, Fan Wu, Xiaohang Li, Zixing Liu</i>	
Robust Iris Recognition Framework Using Computer Vision Algorithms .....	101
<i>Nashwan Jasim Hussein</i>	
<b>Smart Cities and Smart Systems</b>	
The Problem Analysis and Solution Suggestion in the Process of City Information Model Construction .....	109
<i>Zhen Wang, Haifeng Jiang, Wencheng Zhang, Liwei Liu</i>	
Identifying Patterns of Neighbourhood Change Based on Spatiotemporal Analysis of Airbnb Data in Dublin .....	113
<i>Hamidreza Rabiei-Dastjerdi and Gavin McArdle</i>	
Overview and Applicability of Land Use-mixed Indices in the Smart City.....	118
<i>Jiacheng Jiao and Baibai Fu</i>	
Environmental Impact Analysis and Error Correction Method of Smart Meter On-site Verification .....	124
<i>Huanning Wang, Zhihua Zhao, Yan Huang, Hejun Yao, Yuan Liu, Xugang Gai, Hengyu Tan</i>	

A Smart Integration Layer for Smart City Business Applications .....	129
<i>Daniel Spieldennner, Torsten Spieldennner</i>	
Community Safety Well-Being and Touristic Spots: A Model Proposal to Correlate Safe Places and Touristic Spots Based in Open Data .....	136
<i>Dineu Assis, Miguel de Castro Neto, and Marcel Motta</i>	
Challenges of Smart Cities: How Smartphone Apps Can Improve the Safety of Women.....	145
<i>Zully Amairany Montiel Fernandez, Mario Alberto Torres Cruz, Christian Peñaloza, Javier Hidalgo Morgan</i>	
Error Correction Method for Smart Energy Meter Field Calibration System under Non-standard Conditions .....	149
<i>Tan Hengyu, Yao Hejun, Huang Yan, Wang Huanning, Zhao Zhihua, Liu Yuan</i>	
<b>Smart Buildings and Energy</b>	
Bi-level Combinatorial Optimal Dispatch for New-town with Multi-Energy Industrial Parks under Carbon Emission Constraints .....	154
<i>Haifei Gu, Yang Li, Jie Yu, Tongtong Zhang</i>	
Optimal Indoor Plant Layout for Purifying Indoor Air .....	160
<i>Lin Chia-Hui</i>	
A Model-free Reinforcement Learning Approach for the Energetic Control of a Building with Non-stationary User Behaviour.....	168
<i>Nassim Haddam, Benjamin Cohen Boulakia, Dominique Barth</i>	
Day-ahead Peak Regulation of Building Energy System with Multi-loads Rebound Effect .....	178
<i>Lu Chen, Yongbiao Yang, Qingshan Xu</i>	
Author Index.....	183