

2017 19th International Conference on Intelligent System Application to Power Systems (ISAP 2017)

**San Antonio, Texas, USA
17-20 September 2017**



**IEEE Catalog Number: CFP17755-POD
ISBN: 978-1-5090-4001-8**

**Copyright © 2017 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:	CFP17755-POD
ISBN (Print-On-Demand):	978-1-5090-4001-8
ISBN (Online):	978-1-5090-4000-1

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

TABLE OF CONTENTS

A TARGETED ATTACK FOR ENHANCING RESILIENCY OF INTELLIGENT INTRUSION DETECTION MODULES IN ENERGY CYBER PHYSICAL SYSTEMS	1
<i>M. El Hariri ; E. Harmon ; H. F. Habib ; T. Youssef ; O. A. Mohammed</i>	
AN OVERVIEW OF CONTROL ARCHITECTURE FOR NEXT GENERATION SMART GRIDS	7
<i>Ahsan Shahid</i>	
STATISTICAL ANALYSIS AND MODELING OF PLUG-IN ELECTRIC VEHICLE CHARGING DEMAND IN DISTRIBUTION SYSTEMS	12
<i>Qin Yan ; Cheng Qian ; Bei Zhang ; Mladen Kezunovic</i>	
METHODOLOGY FOR ISLANDING OPERATION OF DISTRIBUTED SYNCHRONOUS GENERATORS	18
<i>P. J. Colorado ; D. L. Silva ; A. P. Grilo</i>	
IMPROVING POWER SYSTEM NEURAL NETWORK CONSTRUCTION USING MODAL ANALYSIS	24
<i>Joshua Johnson ; Shamina Hossain-McKenzie ; Uyen Bui ; Sriharsha Etigowni ; Katherine Davis ; Saman Zonouz</i>	
REAL-TIME DETECTION OF MALICIOUS PMU DATA	30
<i>Zeyu Mao ; Ti Xu ; Thomas J. Overbye</i>	
A SIMILARITY-BASED PMU ERROR DETECTION TECHNIQUE	36
<i>Ikponmwosa Idehen ; Thomas Overbye</i>	
RISK-BASED CONSTRAINT RELAXATION WITH HIGH PENETRATION OF WIND RESOURCES	42
<i>Xian Guo ; James McCalley</i>	
A DATA-DRIVEN APPROACH TO POWER SYSTEM DYNAMIC STATE ESTIMATION	48
<i>Deepika Kumari ; S. P. Bhattacharyya</i>	
A STOCHASTIC GAME FRAMEWORK FOR REACTIVE POWER RESERVE OPTIMIZATION AND VOLTAGE PROFILE IMPROVEMENT	54
<i>Md Arifin Arif ; Mandoye Ndoeye ; Gregory V. Murphy ; Kennedy Aganah</i>	
TRANSIENT STABILITY IMPROVEMENT ANALYSIS AMONG THE SERIES FAULT CURRENT LIMITERS FOR DFIG BASED WIND GENERATOR	60
<i>Md Emrad Hossain</i>	
MODELING A DFIG BASED WIND SYSTEM FOR UNBALANCED GRID VOLTAGE CONDITION	66
<i>Choroq. Z El Archi ; Tamou Nasser ; Jorge Alvarado</i>	
HYBRID CASCADING OUTAGE ANALYSIS OF EXTREME EVENTS WITH OPTIMIZED CORRECTIVE ACTIONS	71
<i>Mallikarjuna R. Vallem ; Bharat Vyakaranam ; Jesse T. Holzer ; Nader A. Samaan ; Yuri V. Makarov ; Ruisheng Diao ; Qiuhua Huang ; Xinda Ke</i>	
INTELLIGENT DEMAND RESPONSE FOR ELECTRICITY CONSUMERS: A MULTI-ARMED BANDIT GAME APPROACH	77
<i>Zibo Zhao ; Andrew L. Liu</i>	
MULTI-KERNEL ASSIMILATION FOR PREDICTION INTERVALS IN NODAL SHORT TERM LOAD FORECASTING	83
<i>Miltiadis Alamaniotis ; Lefteri H. Tsoukalas</i>	
POWER SYSTEM DECOMPOSITION FOR PRACTICAL IMPLEMENTATION OF BULK-GRID VOLTAGE CONTROL METHODS	89
<i>Mallikarjuna R. Vallem ; Bharat Vyakaranam ; Jesse T. Holzer ; Marcelo A. Elizondo ; Nader A. Samaan</i>	
VOLTAGE REGULATORS ALLOCATION IN POWER DISTRIBUTION NETWORKS: A TABU SEARCH APPROACH	95
<i>José Ubirajara Núñez De Nunes ; Arturo Suman Bretas</i>	
AN EFFECTIVE FEATURE EXTRACTION METHOD IN PATTERN RECOGNITION BASED HIGH IMPEDANCE FAULT DETECTION	101
<i>Qiushi Cui ; Khalil El-Arroudi ; Geza Joos</i>	
AVERAGE ELECTRICAL DISTANCE-BASED BUS CLUSTERING METHOD FOR NETWORK EQUIVALENCE	107
<i>Muhammad Nauman Rafiq ; Dhruv Sharma ; Di Wu ; John N. Jiang ; Chongqing Kang</i>	
FORECAST OF ELECTRIC VEHICLE CHARGING DEMAND BASED ON TRAFFIC FLOW MODEL AND OPTIMAL PATH PLANNING	113
<i>Shu Su ; Hang Zhao ; Hongzhi Zhang ; Xiangning Lin ; Feipeng Yang ; Zhengtian Li</i>	

ESTIMATION OF POWER SYSTEM INERTIA USING PARTICLE SWARM OPTIMIZATION.....	119
<i>Dimitrios Zografos ; Mehrdad Ghandhari ; Kaveh Paridari</i>	
MODEL REDUCTION FOR FAST ASSESSMENT OF GRID IMPACT OF HIGH PENETRATION PV.....	125
<i>Yazhou Jiang ; Naresh Acharya ; Yan Pan</i>	
A DYNAMIC CURRENT ALLOCATION ALGORITHM FOR ALIENATION COEFFICIENT BASED BUSBAR FAULT DISCRIMINATOR.....	131
<i>Monir Hossain ; Lipika Mittal ; Parviz Rastgoufard</i>	
DEPENDABLE MULTI-POPULATION DIFFERENTIAL EVOLUTIONARY PARTICLE SWARM OPTIMIZATION FOR OPTIMAL OPERATIONAL PLANNING OF ENERGY PLANTS.....	137
<i>Norihiro Nishimura ; Yoshikazu Fukuyama ; Tetsuro Matsui</i>	
TOTAL OPTIMIZATION OF SMART COMMUNITY USING SEQUENCE-BASED DETERMINISTIC INITIALIZATION AND K-MEANS BASED INITIAL SEARCHING POINTS GENERATION.....	143
<i>Mayuko Sato ; Yoshikazu Fukuyama</i>	
DISTRIBUTED CONTROLLER ROLE AND INTERACTION DISCOVERY.....	149
<i>Shamina Hossain-McKenzie ; Katherine Davis ; Maryam Kazerooni ; Sriharsha Etigowni ; Saman Zonouz</i>	
VARIABILITY EXTRACTION AND SYNTHESIS VIA MULTI-RESOLUTION ANALYSIS USING DISTRIBUTION TRANSFORMER HIGH-SPEED POWER DATA.....	155
<i>Manohar Chamana ; Barry Mather</i>	
OPTIMAL DG ALLOCATION AND SIZING IN RADIAL DISTRIBUTION NETWORKS BY CUCKOO SEARCH ALGORITHM.....	161
<i>Maryam Majidi ; Aydogan Ozdemir ; Oguzhan Ceylan</i>	
RCAM BASED MAINTENANCE PLAN OF THE POWER TRANSFORMERS USING K-MEANS CLUSTERING ALGORITHM.....	167
<i>Aysun Koksall ; Aydogan Ozdemir ; Oguz Ata</i>	
PRIMARY FREQUENCY REGULATION IN ISLANDEC MICROGRIDS THROUGH DROOP-BASED GENERATION AND DEMAND CONTROL.....	173
<i>Andrew Klem ; Kaveh Dehghanpour ; Hashem Nehrir</i>	
AGENT-BASED DISTRIBUTED UNDERFREQUENCY LOAD SHEDDING.....	179
<i>Jing Xie ; Chen-Ching Liu ; Marino Sforna</i>	
PHASOR MEASUREMENTS ESTIMATION ON DISTRIBUTION NETWORKS USING MACHINE LEARNING.....	185
<i>Silviu Nistor ; Aftab Khan ; Mahesh Sooriyabandara</i>	
DATA-DRIVEN ENERGY MANAGEMENT ARCHITECTURE FOR MORE-ELECTRIC AIRCRAFTS.....	191
<i>Mohasinina Binte Kamal ; Jin Wei ; Gihan J. Mendis</i>	
UNIT COMMITMENT USING GRAVITATIONAL SEARCH ALGORITHM WITH HOLOMORPHIC EMBEDDED APPROACH.....	197
<i>Anup Shukla ; James A Momoh ; S. N. Singh</i>	
THREE-PHASE LINE OVERLOADING PREDICTIVE MONITORING UTILIZING ARTIFICIAL NEURAL NETWORKS.....	203
<i>Rafik Fainti ; Miltiadis Alamaniotis ; Lefteri H. Tsoukalas</i>	
AN INTELLIGENT PARALLEL SCHEDULING METHOD FOR OPTIMAL TRANSMISSION SWITCHING IN POWER SYSTEMS WITH BATTERIES.....	209
<i>Tian Lan ; Garng M. Huang</i>	
INTELLIGENT SYSTEM FOR AUTOMATIC PERFORMANCE EVALUATION OF DISTRIBUTION SYSTEM OPERATORS.....	215
<i>R. C. G. Teive ; E. A. C. Aranha Neto ; F. L. R. Mussoi ; A. L. R. Rese ; J. Coelho ; F. F. Andrade ; F. L. Cardoso ; F. Nogueira ; J. P. Parreira</i>	
DESIGN OF A MULTI-AGENT SYSTEM FOR DISTRIBUTED VOLTAGE REGULATION.....	221
<i>Minjiang Chen ; Dimitrios Athanasiadis ; Badr Al Faiya ; Stephen McArthur ; Ivana Kockar ; Haowei Lu ; Francisco De Leon</i>	
A COMPARISON OF PLACEMENT METHODS FOR COLLECTING PMU DATA USED IN ANGULAR STABILITY DETECTION.....	227
<i>Javier A. López ; Chan-Nan Lu</i>	
A PMU-BASED VOLTAGE SECURITY ASSESSMENT FRAMEWORK USING Hoeffding-TREE-BASED LEARNING.....	233
<i>Zhijie Nie ; Duotong Yang ; Virgilio Centeno ; Kevin D. Jones</i>	
A NOVEL DETERMINISTIC AND PROBABILISTIC DYNAMIC SECURITY ASSESSMENT APPROACH FOR ISOLATED MICROGRIDS.....	239
<i>Salman Mashayekh ; Karen L. Butler-Purry</i>	

OPTIMAL SIZING AND PLACEMENT OF DISTRIBUTED GENERATION: MILP VS PSO COMPARISON IN A REAL MICROGRID APPLICATION	245
<i>Miguel Heleno ; Salman Mashayekh ; Michael Stadler ; Goncalo Cardoso ; Rodrigo De Luis</i>	
MULTI-OBJECTIVE EV CHARGING STATIONS PLANNING BASED ON A TWO-LAYER CODING SPEA-II	251
<i>Shi Ruijeng ; Yang Yang ; Kwang Y. Lee</i>	
EVENT ANALYSIS OF PULSE-RECLOSERS IN DISTRIBUTION SYSTEMS THROUGH SPARSE REPRESENTATION	257
<i>M. Ehsan Raoufat ; Ali Taalimi ; Kevin Tomsovic ; Robert Hay</i>	
OPTIMAL SCHEDULING OF DISTRIBUTED ENERGY RESOURCES BY MODERN HEURISTIC OPTIMIZATION TECHNIQUE	263
<i>Wenlei Bai ; Ibrahim Eke ; Kwang Y. Lee</i>	
FUZZY LOGIC APPROACH FOR INERTIAL AND FREQUENCY RESPONSE FROM CONVERTER BASED WIND POWER UNITS	269
<i>Miguel Ramírez ; Rafael Castellanos ; J. Guillermo Calderón</i>	
MODIFIED TEACHING-LEARNING BASED OPTIMIZATION ALGORITHM AND DAMPING OF INTER-AREA OSCILLATIONS THROUGH VSC-HVDC	274
<i>Miguel Ramírez ; Rafael Castellanos ; J. Guillermo Calderón</i>	
RESERVE COSTS ALLOCATION MODEL FOR ENERGY AND RESERVE MARKET SIMULATION	280
<i>Tiago Pinto ; Amin Shokri Gzafroudi ; Francisco Prieto-Castrillo ; Gabriel Santos ; Francisco Silva ; Juan Manuel Corchado ; Zita Vale</i>	
EPEX ONTOLOGY: ENHANCING AGENT-BASED ELECTRICITY MARKET SIMULATION	286
<i>Gabriel Santos ; Tiago Pinto ; Isabel Praca ; Zita Vale</i>	
MULTI-AGENT BASED DISTRIBUTED POWER AGREEMENT FOR ENHANCED FREQUENCY RESPONSE OF TRANSMISSION SYSTEMS	292
<i>Muhammad Umer Qureshi ; Santiago Grijalva</i>	
INTELLIGENT MICROGRID POWER MANAGEMENT USING THE CONCEPT OF NASH BARGAINING SOLUTION	298
<i>Kaveh Dehghanpour ; Hashem Nehrir</i>	
CONSTRUCTIVE METAHEURISTICS APPLIED TO TRANSMISSION EXPANSION PLANNING WITH SECURITY CONSTRAINTS	303
<i>Armando M. Leite Da Silva ; Fernando A. De Assis ; Luiz A. F. Manso ; Muriell R. Freire ; Silvan A. Flávio</i>	
LOAD CONSUMPTION PREDICTION UTILIZING HISTORICAL WEATHER DATA AND CLIMATE CHANGE PROJECTIONS	310
<i>Po-Chen Chen ; Mladen Kezunovic</i>	
VOLTAGE SECURITY CONSTRAINED LOOK-AHEAD COORDINATION OF REACTIVE POWER SUPPORT DEVICES WITH HIGH RENEWABLES	316
<i>Xinbo Geng ; Le Xie ; Diran Obadina</i>	
MULTI-OBJECTIVE ROBUST OPTIMIZATION TO SOLVE ENERGY SCHEDULING IN BUILDINGS UNDER UNCERTAINTY	322
<i>Joao Soares ; Zita Vale ; Nuno Borges ; Fernando Lezama ; Nelson Kagan</i>	
EVOLUTIONARY FRAMEWORK FOR MULTI-DIMENSIONAL SIGNALING METHOD APPLIED TO ENERGY DISPATCH PROBLEMS IN SMART GRIDS	328
<i>Fernando Lezama ; Enrique Munoz De Cote ; Luis Enrique Sucar ; João Soares ; Zita Vale</i>	
SENSITIVITY GUIDED GENETIC ALGORITHM FOR PLACEMENT OF DISTRIBUTED ENERGY RESOURCES	334
<i>Yuting Tian ; Niannian Cai ; Mohammed Benidris ; Atri Bera ; Joydeep Mitra ; Chanan Singh</i>	
IS BIG DATA SUFFICIENT FOR A RELIABLE DETECTION OF NON-TECHNICAL LOSSES?	339
<i>Patrick Glauner ; Angelo Miglioni ; Jorge Augusto Meira ; Petko Valtchev ; Radu State ; Franck Bettinger</i>	
A SEMI-ANALYTICAL METHOD TO SOLVE CHANCE CONSTRAINED STOCHASTIC ECONOMIC DISPATCH WITH DEMAND RESPONSE PROVIDERS	345
<i>Hao Ming ; Le Xie</i>	
ONLINE INTELLIGENT TECHNIQUE FOR PREVENTING RELAY MALOPERATION UNDER STRESSED CONDITIONS	351
<i>Sayari Das ; Bijaya Ketan Panigrahi</i>	
MERGING CONVENTIONAL AND PHASOR MEASUREMENTS IN STATE ESTIMATION: A MULTI-CRITERIA PERSPECTIVE	357
<i>Bruna Tavares ; Victor Freitas ; Vladimiro Miranda ; Antonio Simões Costa</i>	
DETECTION OF ROGUE NODES IN AMI NETWORKS	363
<i>Abhijeet Sahu ; H N R Karthik Tippanaboyana ; Lindsay Hefton ; Ana Goulart</i>	

MACHINE LEARNING VERSUS RAY-TRACING TO FORECAST IRRADIANCE FOR AN EDGE-COMPUTING SKYIMAGER.....	369
<i>Walter Richardson ; Hariharan Krishnaswami ; Les Shephard ; Rolando Vega</i>	
AUTOMATIC IDENTIFICATION, CLUSTERING AND REPORTING OF RECURRENT FAULTS IN ELECTRIC DISTRIBUTION FEEDERS	375
<i>Karthick Manivinnan ; Carl L. Benner ; B. Don Russell ; Jeffrey A. Wischkaemper</i>	
A GRAPH MODEL FOR ENHANCING SITUATIONAL AWARENESS IN POWER SYSTEMS.....	381
<i>Mirjavad Hashemi Gavgani ; Sara Eftekharnjad</i>	
Author Index	