

# **2014 IEEE Symposium on Computational Intelligence Applications in Smart Grid**

## **(CIASG 2014)**

**Orlando, Florida, USA  
9-12 December 2014**



**IEEE Catalog Number: CFP1499M-POD  
ISBN: 978-1-4799-4545-0**

## TABLE OF CONTENTS

<b>IEEE SSCI 2014 General Committee .....</b>	<b>vi</b>
<b>IEEE CIASG 2014 Committee .....</b>	<b>vii</b>
<b>Keynote Talk: CIASG'14 .....</b>	<b>viii</b>
<b>Wednesday, December 10</b>	
<b>9:20AM-10:00AM</b>	
<b>CIASG'14 Keynote Talk:</b>	
<i><b>Computational Systems Thinking for Transformation of Smart Grid Operations</b></i>	
Kumar Venayagamoorthy	
<b>10:20AM-12:00PM</b>	
<b>CIASG'14 Session 1: Forecasting and Predictions in Smart Grids</b>	
Chair: G. Kumar Venayagamoorthy	
10:20AM <b><i>A Time Series Ensemble Method to Predict Wind Power .....</i></b>	<b>1</b>
Sumaira Tasnim, Ashfaqur Rahman, Gm Shafiullah, Amanullah Oo and Alex Stojcevski	
10:40AM <b><i>Neural Network Forecasting of Solar Power for NASA Ames Sustainability Base .....</i></b>	<b>6</b>
Chaitanya Poolla, Abe Ishihara, Steve Rosenberg, Rodney Martin, Chandrayee Basu, Alex Fong and Sreejita Ray	
11:00AM <b><i>Comparison of Echo State Network and Extreme Learning Machine for PV Power Prediction.....</i></b>	<b>14</b>
Iroshani Jayawardene and Ganesh Venayagamoorthy	
11:20AM <b><i>Accurate Localized Short Term Weather Prediction for Renewables Planning .....</i></b>	<b>22</b>
David Corne, Manjula Dissanayake, Andrew Peacock, Stuart Galloway and Edward Owens	
11:40AM <b><i>Intelligent Analysis of Wind Turbine Power Curve Models .....</i></b>	<b>30</b>
Arman Goudarzi, Innocent Davidson, Afshin Ahmadi and Ganesh Kumar Venayagamoorthy	
<b>1:30PM-3:10PM</b>	
<b>CIASG'14 Session 2: Micro-grids &amp; Electric Vehicles</b>	
Chair: Edgar Sanchez	
1:30PM <b><i>Performance of a Smart Microgrid with Battery Energy Storage System's Size and State of Charge .....</i></b>	<b>B45</b>
Afshin Ahmadi, Ganesh Kumar Venayagamoorthy and Ratnesh Sharma	
1:50PM <b><i>A Simple Recurrent Neural Network for Solution of Linear Programming: Application to a Microgrid.....</i></b>	<b>44</b>
Juan Diego Sanchez-Torres, Martin J. Loza-Lopez, Riemann Ruiz-Cruz, Edgar Sanchez and Alexander G. Loukianov	
2:10PM <b><i>Parallel Tempering for Constrained Many Criteria Optimization in Dynamic Virtual Power Plants.....</i></b>	<b>51</b>
Joerg Bremer and Michael Sonnenschein	
2:30PM <b><i>Non-convex Dynamic Economic/Environmental Dispatch with Plug-in Electric Vehicle Loads .....</i></b>	<b>59</b>
Zhile Yang, Kang Li, Qun Niu, Cheng Zhang and Aoife Foley	
2:50PM <b><i>Coordinated Electric Vehicle Charging Solutions Using Renewable Energy Sources.....</i></b>	<b>66</b>
Kumarsinh Jhala, Balasubramaniam Natarajan, Anil Pahwa and Larry Erickson	

**3:30PM-5:10PM**

**CIASG'14 Session 3: Markets**

Chair: Hiroyuki Mori

3:30PM	<i>A Kalman Filtering approach to the detection of option mispricing in electric power markets.....</i>	72
	Gerasimos Rigatos	
3:50PM	<i>LMP Forecasting with Prefiltered Gaussian Process.....</i>	78
	Hiroyuki Mori and Kaoru Nakano	
4:10PM	<i>An Efficient Iterative Double Auction for Energy Trading in Microgrids .....</i>	84
	Bodhisattwa Majumder, Mohammad Faqiry, Sanjoy Das and Anil Pahwa	
4:30PM	<i>Smart Grid Energy Fraud Detection Using Artificial Neural Networks.....</i>	91
	Vitaly Ford, Ambareen Siraj and William Eberle	

**Thursday, December 11**

**10:20AM-12:00PM**

**CIASG'14 Session 4: Distribution Systems**

Chair: Zita Vale

10:20AM	<i>Pulsed Power Network Based on Decentralized Intelligence for Reliable and Low Loss Electrical Power Distribution.....</i>	97
	Hisayoshi Sugiyama	
10:40AM	<i>Distributed Volt/Var Control in Unbalanced Distribution Systems with Distributed Generation .....</i>	103
	Ahmad Reza Malekpour, Anil Pahwa and Balasubramaniam Natarajan	
11:00AM	<i>A Uniform Implementation Scheme for Evolutionary Optimization Algorithms and the Experimental Implementation of an ACO Based MPPT for PV Systems under Partial Shading .....</i>	109
	Lian lian Jiang and Douglas L. Maskell	

**1:30PM-3:10PM**

**CIASG'14 Session 5: Optimization and Scheduling**

Chair: Zita Vale

1:30PM	<i>An Evolutionary Approach for the Demand Side Management Optimization in Smart Grid .....</i>	117
	Andre Vidal, Leonardo Jacobs and Lucas Batista	
1:50PM	<i>Quantum-based Particle Swarm Optimization Application to Studies of Aggregated Consumption Shifting and Generation Scheduling in Smart Grids .....</i>	124
	Pedro Faria, Joao Soares and Zita Vale	
2:10PM	<i>A New Heuristic Providing an Effective Initial Solution for a Simulated Annealing approach to Energy Resource Scheduling in Smart Grids .....</i>	132
	Tiago Sousa, Hugo Morais, Rui Castro and Zita Vale	
2:30PM	<i>A Learning Algorithm and System Approach to Address Exceptional Events in the Domestic Consumption Management.....</i>	140
	Luis Gomes, Filipe Fernandes, Zita Vale, Pedro Faria and Carlos Ramos	

**3:30PM-5:10PM**

**CIASG'14 Session 6: Stability and Analysis**

Chair: G. Kumar Venayagamoorthy

3:30PM	<i>Remote Power System Stabilizer Tuning Using Synchrophasor Data.....</i>	147
	Paranietharan Arunagirinathan, Hany Abdelsalam and Ganesh Venayagamoorthy	

3:50PM	<b><i>Multi-Machine Power System Control based on Dual Heuristic Dynamic Programming.....</i></b>	<b>154</b>
	Zhen Ni, Yufei Tang, Haibo He and Jinyu Wen	
4:10PM	<b><i>Impact of Signal Transmission Delays on Power System Damping Control Using Heuristic Dynamic Programming .....</i></b>	<b>161</b>
	Yufei Tang, Xiangnan Zhong, Zhen Ni, Jun Yan and Haibo He	
4:30PM	<b><i>Time-Delay Analysis on Grid-Connected Three-Phase Current Source Inverter based on SVPWM Switching Pattern.....</i></b>	<b>168</b>
	Arman Sargolzaei, Amirhasan Moghadasi, Kang Yen and Arif Sarwat	
4:50PM	<b><i>A low-complexity energy disaggregation method: Performance and robustness .....</i></b>	<b>173</b>
	Hana Altrabalsi, Jing Liao, Lina Stankovic and Vladimir Stankovic	

**5:10PM-6:45PM**

**Poster Session: SSCI'14 Poster Session**

P113	<b><i>RSS based Loop-free Compass Routing Protocol for Data Communication in Advanced Metering Infrastructure (AMI) of Smart Grid .....</i></b>	<b>181</b>
	Imtiaz Parvez, Mahdi Jamei, Aditya Sundararajan and Arif I Sarwat	
P114	<b><i>Frequency Band for HAN and NAN Communication in Smart Grid.....</i></b>	<b>187</b>
	Imtiaz Parvez, Aditya Sundararajan and Arif I Sarwat	

<b>AUTHOR INDEX.....</b>	<b>192</b>
--------------------------	------------