2017 6th International Conference on Computer Applications In Electrical Engineering-Recent Advances (CERA 2017)

Roorkee, India 5-7 October 2017



IEEE Catalog Number: ISBN:

CFP17K08-POD 978-1-5090-4875-5

Copyright \odot 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:
 CFP17K08-POD

 ISBN (Print-On-Demand):
 978-1-5090-4875-5

 ISBN (Online):
 978-1-5090-4874-8

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



TABLE OF CONTENTS

TS-01: Renewable Energy Systems

Optimization Method for Power Regulation in Wind Turbine Coupled to Doubly-fed Induction Generator

Umesh Chaudhary

7 Optimal Sizing of a Stand-alone PV/Wind/MHP/Biomass Based Hybrid Energy System Using PSO Algorithm

Anurag Chauhan and Vinay Kumar Dwivedi

13 Investigation of Grid-Structure Interaction of Wind Turbine Driven DFIG Using FAST and Simulink

Ganesh P. Prajapat

19 Load Following Capability of Fuel Cell-Microturbine Based Hybrid Energy System for Microgrid Operation

Shiv Raman, Sukumar Mishra and Rishi Kant Sharma

Voltage and Frequency Control of a Hybrid Wind-Diesel System Using SVC and Predictively Controlled SMES

Mubashar Zargar, Miraj Mufti and Shameem Lone

- 31 Solar PV Fed Standalone DC Microgrid with Hybrid Energy Storage System Smita Sinha, Avinash K. Sinha and Prabodh Bajpai
- 37 Speed Sensorless MPPT Control of Stand-alone SEIG Based Wind-Battery Hybrid System Jyotismita Mishra
- 42 Battery State of Charge Based Algorithm for Optimal Wind Farm Power Management Pranav Patel and Dipankar Deb

TS-02: Power System Analysis and Protection

- 47 **Bi-Directional Fast Bus Transfer Scheme for Three Interconnected Busbars**Viral Kansara
- Optimal Coordination of Overcurrent Relays in Power Systems for Reliability Assessment
 Under the Presence of Distributed Generation Using ETAP
 Swapnil Yadav, Namami Krishna Sharma, Sharat Choube and Aishwarya Varma
- Detection of Fault During Power Swing Using Superimposed Negative Sequence Apparent Power Based Scheme

Jitendra Kumar and Premalata Jena

- 63 Secured Zone 3 Protection During Load Encroachment Using Synchrophasors Saumendra Sarangi and Premalata Jena
- 69 Islanding Scheme for Power Transmission Utilities

 Manohar Singh, Kammasandra Meera, Paritosh Joshi and Prem Prakash

74	A Robust Load Flow Algorithm to Solve Power Distribution Network Reconfiguration Problem with a Population Based Meta-heuristic Approach
	Usharani Raut and Sivkumar Mishra
80	Investigation of Network Reconfiguration on the Reliability and Performance of Distribution Systems Using CRO
	Piyush Sharma, Nikhil Gupta, Khaleequr Rehman Niazi and Anil Swarnkar
86	Multi-Stage Voltage Dependent Load Modelling of Fast Charging Electric Vehicle Akanksha Shukla, Kusum Verma and Rajesh Kumar
	TS-03: Electronics and Communication
92	Rough Set Based Feature Selection Using Swarm Intelligence with Distributed Sampled Initialisation
	Tarun Maini, Abhishek Kumar, R Misra and Devender Singh
98	Capacitive and Resistive Sensing Based on Compensated Relaxation Oscillator Tushar Tyagi and P Sumathi
103	Design and Implementation of Compatible VoIP <i>Nisarg Brahmbhatt, Pankaj Mann and Abhishek Rawat</i>
108	Design and Implementation of Phase Detector on FPGA Praveen Kumar, Vishal Kumar and Rajendra Pratap
111	Estimation of ATC Using PS-NR Devesh Shukla, Srilakshmi Edathil and Singh S p
117	Hybrid Adaptive Beamforming Algorithms for Smart Antennas <i>Yarlagadda Ramakrishna, Vemuri Ratna Kumari and P V Subbaiah</i>
	TS-04: Renewable Energy Resources
123	Probabilistic Estimation of Capacity Value of Photovoltaic System Ashwini Nayak, Kanungo Barada Mohanty, Kishor Thakre, Vinaya Sagar Kommukuri and Rabi Narayan Mishra
128	Wind Resource Assessment and Energy Analysis for Wind Energy Projects Rajat Kanti Samal and Manish Tripathy
134	On Feasibility of Biomass Power Plant with Agricultural Waste Processing Anil Gojiya and Dipankar Deb
140	Longterm Analysis of Wind Speed and Wind Power Resource Assesment for the Site Vijayawada in Andhra Pradesh, India Sreerama Murthy Kella, Om Parkash Rahi, Preeti Sonkar and Sita Ram Bhardwaj
146	A Novel Electricity Generation with Green Technology by Plant-e from Living Plants and Bacteria Sai Prasann Goud Gurram and Naga Sujatha Kothapalli

152	Control-Oriented Parametrized Models for Microbial Fuel Cells Ravi Mukeshbhai Patel and Dipankar Deb
158	Comparative Study of Fibonacci Pattern and Conventional Pattern of Solar Cell Shahida Khatoon and Huma Khan
	TS-05: Power System Restructuring and Deregulation
164	Scenario Based Uncertainty Modeling of Electricity Market Prices Kailash Chand Sharma, Rohit Bhakar, Harpal Tiwari and Sandeep Chawda
169	Retailer Risk-Based Trading Decision Making Model Under Price Responsive Demand Sandeep Chawda, Parul Mathuria, Rohit Bhakar, Sreenu Sreekumar, Vivek Prakash and Falti Teotia
175	A Review on Some Aspects of Transmission Pricing in Power System Network Kaushik Paul and Niranjan Kumar
181	Multi-objective Congestion Management Approach in Competitive Electricity Markets Amit Saraswat and Ashish Saini
187	Power Flow and Economic Dispatch of a Microgrid in Presence of Feeder Flow Control Distributed Generators Avirup Maulik and Debapriya Das
193	Cost Minimization in Multi Wind Farm Power Dispatch Ashish Shandilya and Dipankar Deb
199	A Novel Hybrid Approach Using Wavelet Transform, Time Series Time Delay Neural Network, and Error Predicting Algorithm for Day-Ahead Electricity Price Forecasting Abhinav Aggarwal and Madan Mohan Tripathi
	TS-06: Condition Monitoring of Power Apparatus
205	A Novel Method to Predict Moisture in Cellulosic Insulation of Power Transformer with Improved Accuracy Using Time Domain Spectroscopy Data Richa Goel, Hari Charan Verma, Arijit Baral and Sivaji Chakravorti
209	Comparison of Different Methods Available for Evaluating Remaining Life of OIP Insulation Used in Power Transformers Aprajita Kumari, Hari Charan Verma, Arijit Baral and Sivaji Chakravorti
215	Effect of Humidity on Leakage Current of a Contaminated 11 kV Porcelain Pin Insulator Suhas Deb, Riddhi Ghosh, Santu Dutta, Sovan Dalai and Biswendu Chatterjee
220	Studies on the Effect of Void Geometry and Location on Electric Field Distribution and Partial Discharge in XLPE Insulated Power Cable Using Finite Element Analysis Method Nasirul Haque, Souryadeep Basak, Sambit Hore, Monish Mukherjee and Sovan Dalai
226	Effect of Filler Concentration on the Breakdown Strength of Epoxy Nanocomposites Elanseralathan Kasinathan, Karthick V, DineshKumar R s and Sharathraj Mellam

230	A Novel Scheme for Condition Monitoring of Indirect Unsymmetrical Phase Shift Transformer Manoj Tripathy
236	Internal Arc Fault Simulation Using CFD to Predict Thermal Behavior in Switchgear Parkash Kumar, Amol Kale and Mahesh Ranade
242	The Effect of Solar Power Injection on Aging of a Distribution Transformer Kanhaiya Kumar and Ganesh Kumbhar
	TS-07: Smart Grid Technologies and its applications
247	Intentional Islanding of Microgrid Mohit Sharma, Praveen Kumar and Vishal Kumar
252	Multi-Functional Charger for Electric Vehicle Operating with Grid and SPV Generation Anjeet Verma and Bhim Singh
258	Passivity Based Distributed Event-triggered Load Frequency Control Pratyasa Bhui
264	Event-Triggered Control for Frequency Regulation of Single-Area Thermal Power System Pankaj Dahiya, Pankaj Mukhija and Anmol Ratna Saxena
270	Robust Control Algorithm of Grid Interfaced Solar PV System Kanchan Mathuria, Ikhlaq Hussain and Bhim Singh
276	State Space Modelling, Analysis and Optimization of Microgrid Droop Controller Binu Krishnan U, Mija J and Elizabeth Cheriyan
282	Superimposed Positive Sequence Voltage and Current Based Islanding Detection Techniques for Microgrid Abhisek Mishra and Premalata Jena
286	Testing A Communication Assisted Protection Scheme for AC Microgrid in A Laboratory Setup Kuldip Nayak, Rabindra Mohanty and Ashok Pradhan
	TS-08: Electric Drives
291	Performance Evaluation of Multi-Level Inverter Fed Open-end Winding IM Drive Under Two Different Modulation Schemes Sanjiv Kumar and Pramod Agarwal
297	Speed Control and Electrical Braking of Axial Flux BLDC Motor Pooja Awari
303	Half Bridge Module Asymmetric Multilevel Inverter Based on Novel PWM Control Strategy Rakesh Kumar Kumawat and Dheeraj Kumar Palwalia

308	Performance Evaluation of an Induction Motor Drive with Direct Torque Control for Open-
	End Winding and Cascaded Three-Level Topologies
	Somasekhar Veeramraju Tirumala, Suresh Lakhimsetty, Satelli Siva Prasad and Rajendra Singh
	Rathore

- Combination of Switching Sequences in SVPWM to Reduce Line Current Ripple for IM Drives Rohit Goyal, B Hemanth Kumar and Makrand Lokhande
- Performance Comparison of Different Vector Control Approaches for a Synchronous Reluctance Motor Drive

 Pradyumna Ghosh, Anandarup Das and G. Bhuvaneswari
- 326 A Self-sufficient Solar Powered SRM Driven Irrigation Pump Utilizing Modified Zeta Converter

Vijaytarang Narayan, Anjanee Mishra and Bhim Singh

TS-09: Power System Stability and Control

- 332 ANN Application for Voltage Security Assessment of a Large Test Bus System Shubhranshu Kr. Tiwary and Jagadish Pal
- 335 Transient Stability Assessment of DFIG Integrated Distribution System Kuldeep Ahlawat and Kusum Verma
- Optimal Load Shedding to Improve Static Voltage Stability Employing Black Hole Optimization Algorithm

 Namami Krishna Sharma, Aishwarya Varma, Sharat Choube and Swapnil Yadav
- 347 Modeling and Simulation of a Superconducting Magnetic Energy Storage Based Multi-Machine Power System for Transient Stability Study Hailiya Ahsan and Miraj Mufti
- Design of Fuzzy-PID Controller with Derivative Filter and Its Application Using Firefly Algorithm to Automatic Generation Control

 Manoj Kumar Debnath, Ranjan Mallick, Priyambada Satapathy and Jyoti Padhi
- Assessment of Voltage Stability of an Unbalanced Distribution System with Type-3 Wind Generator

Tanaya Datta, Avinash K. Sinha and Prabodh Bajpai

Optimal Placement of PMUs in Power System Network for Voltage Stability Estimation Under Contingencies

Pankaj Sahu and M. K. Verma

TS-10: Digital Signal and Image Processing

371 A Fuzzy C-means Clustering Approach to HMRF-EM Model for MRI Brain Tissue Segmentation

Pranaba Mishro, Sanjay Agrawal, Lingraj Dora and Rutuparna Panda

377	Alpha-trimmed First Order Statistics for the Classification of Liver US Images Nishant Jain and Vinod Kumar
381	Simultaneous Measurement of Thickness and Refractive Index Using Wedge Plate Lateral Shearing Interferometry and Fourier Transform Method Amit Chatterjee, Reena Disawal, Jitendra Dhanotia, Vimal Bhatia and Shashi Prakash
385	Performance Estimation of Numerical Biospeckle Indexing Techniques Using Rotating Diffuser Based Fixed Correlation Modelling Amit Chatterjee, Jitendra Dhanotia, Vimal Bhatia and Shashi Prakash
389	Non-Destructive 3D Profiling of Orthopaedic Titanium Bone Plate Using Fringe Projection Profilometry and Fourier Transform Analysis Amit Chatterjee, Jitendra Dhanotia, Vimal Bhatia and Shashi Prakash
393	Phase Based Single-Channel Speech Enhancement Using Phase Ratio Sachin Singh, A. M. Mutawa, Monika Gupta, Mnaoj Tripathy and R.S Anand
	TS-11: Power Electronics and Applications
397	Comparative Analysis of Dual Active Bridge Isolated DC to DC Converter with Single Phase Shift and Extended Phase Shift Control Techniques Abdul Bhat, Anupam Kumar and Pramod Agarwal
403	Quadratic SEPIC Derived Hybrid Output Converter for Photo-Voltaic Applications Rakesh Maurya and Pravin Patle
409	Non-linear Gain Sixth-order Boost Converter Veerachary M
415	Analysis of Modified Impedance-Network Half- Bridge Converter Veerachary M
421	Modified Soft-switching Scheme for Charge-pump Based IDB Converter Veerachary M and Jyoti Prakash
427	Performance Analysis of Improved q-ZS AC-AC Converter with High Frequency Isolation Kanak Hada, Ashok Kumar Sharma and Pavan Tomar
433	Per Phase Power Balancing in Grid Connected Cascaded H-bridge Multilevel Converter for Solar PV Application Rahul Sharma and Anandarup Das
439	Energy Storage in DC Microgrid System Using Non-Isolated Bidirectional Soft-Switching DC/DC Converter Pavan Tomar, Ashok Kumar Sharma and Kanak Hada
	TS-12: Control System Modelling and Simulation
445	Reduction of Interval Systems Using Kharitonov's Polynomials and Their Derivatives Sudharsana Rao Potturu and Rajendra Prasad

450	Model Order Reduction of Power Electronic Circuits Hadhiq Khan, Mohammad Abid Bazaz and Shahkar Ahmad Nahvi
456	Optimal Pole Placement for a Self Tuning PID Controller Sasmita Behera, Matruprasad Jyotiranjan and Bibhuti Pati
462	Fuzzy Systems Practices for Aerodynamic Parameter Modeling of the Aircraft Dhan Jeet Singh, Nishchal K Verma, Ajoy Ghosh and Appasaheb Malagaudanavar
468	A Comparative Study of PI & PID Based SMC for Anti-synchronization of Vallis System Jagannath Samantaray, Binoy Krishna Roy and Piyush Pratap Singh
473	Chaotic Time Series Prediction Using ELANFIS Biju M, Shihabudheen K V and Gopinatha Pillai
479	Tuning of Two-DOF-FOPID Controller for Magnetic Levitation System: A Multi-Objective Optimization Approach Prashant Gaidhane, Anupam Kumar and M Nigam
485	Nonlinear State Estimation for Three Tank Experimental Setup: A Comparative Evaluation Sushil Surwase, Devyani Varshney, Nitinkumar Patel and Mani Bhushan
	TS-13: Automation and Robotics
491	A Novel Hybrid Navigation Algorithm for Autonomous Robotic Vacuum Cleaners Saurabh Singh, Dawnee Soman and Vinay K Shetkar
497	A New Approach for Line Following Robot Using Radius of Path Curvature and Differential Drive Kinematics Jitendra Singh and Prashant Singh Chouhan
503	A Build Your Own Robot Manipulator for Manufacturing Education Shunmugham Pandian, Yuki Mitabe, N Sathyakumar, C Parthipan and Subramanian Rajaganapathi
509	Real Time Implementation of MPC in Bottle Washer Machine for Small Scale Beverage Industry Ankur Gajjar, Alpesh Patel and Raviprakash Singh
515	Design and Development of a MODBUS Automation System for Industrial Applications Paavni Shukla, Sonal Singh, Tanmayee Joshi, Sudhakar Kumar, Samrudh Kelkar, Manas Das and Kannan Moudgalya
521	A New Heuristic Algorithm for Three Machines Stochstic Flow Shop Scheduling Model Neelam Tyagi, Ram Prakash Thripathi and A Chandramouli
527	A Nonlinear Fractional Order PID Controller Applied to Redundant Robot Manipulator Anupam Kumar, Prashant Gaidhane and Vijay Kumar

TS-14: Power Quality Issues

533	ANN Based SVPWM for Three-Phase Improved Power Quality Converter Under Disturbed AC Mains
	Abdul Bhat, Deepak Sharma and Aijaz Ahmad
539	Bridgeless ZETA PFC Converter for Low Voltage High Current LED Driver Aman Jha and Bhim Singh
545	Selective Harmonic Elimination in Multilevel Inverters Using Gravitational Search Algorithm Peeyush Kala and Sudha Arora
551	Power Quality Improvement of Grid Interfaced Solar PV Using Adaptive Line Enhancer Based Control Scheme Priyank Shah, Ikhlaq Hussain and Bhim Singh
556	RLMMN Adaptive Filtering Based Control Scheme for Multi-Objective GPV System Srinivas Vedantham, Shailendra Kumar, Bhim Singh and Sukumar Mishra
562	LPPT Control of a Photovoltaic System Against Sudden Drop of Irradiance Kranthi Kumar Reddy M and Vaskar Sarkar
568	Fixed Frequency Control of LCL-T Resonant Power Converter with Capacitive Output Filter Golla Vijaya Bhaskar Reddy, Uday Patil and Nagendrappa H
574	Performance Assessment of Integrated Hybrid Converter for Indian Environmental Conditions Chandra Sekhar B and Sanjay Lakshminarayanan