

# **First International Conference on Power Engineering Computing and Control (PECCON-2017)**

Energy Procedia Volume 117

Chennai, India  
2 – 4 March 2017

Part 1 of 2

## **Editors:**

**V.T. Sreedevi  
S. Hemamalini  
C. Vaithilingam**

ISBN: 978-1-5108-4844-3

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© by Elsevier B.V.  
All rights reserved.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact Elsevier B.V.  
at the address below.

Elsevier B.V.  
Radarweg 29  
Amsterdam 1043 NX  
The Netherlands

Phone: +31 20 485 3911  
Fax: +31 20 485 2457

<http://www.elsevierpublishingsolutions.com/contact.asp>

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

# TABLE OF CONTENTS

## PART 1

<b>EDITORIAL TO THE PROCEEDINGS OF THE FIRST INTERNATIONAL CONFERENCE ON POWER ENGINEERING COMPUTING AND CONTROL, PECCON-2017, 2-4 MARCH 2017</b> .....	1
<i>V. T. Sreedevi, S. Hemamalini, C. Vaithilingam</i>	
<b>OPTIMAL SCHEDULING IN ELECTRICITY MARKETS BY SWARM INTELLIGENCE</b> .....	3
<i>R. Sheeba, Bijuna Kunju. K, M. Jayaraju</i>	
<b>A FAMILY OF QUASI SWITCHED CAPACITOR (QSC) CIRCUIT FOR HALF BRIDGE DC-DC CONVERTER FOR ENERGY STORAGE APPLICATIONS</b> .....	11
<i>Sidra Begum, S. L. V. Sravan Kumar, K. Lokeshwar Rao</i>	
<b>MODELING AND ANALYSIS OF A NOVEL BOOST DERIVED MULTILEVEL HYBRID CONVERTER</b> .....	19
<i>S. Jeyasudha, B. Geethalakshmi</i>	
<b>SIMULATION AND DESIGN OF DECENTRALIZED PI OBSERVER BASED CONTROLLER FOR NONLINEAR INTERCONNECTED SYSTEMS OF THE DIESEL ENGINE AIRPATH</b> .....	27
<i>Rohith Kamath, Vivek Venkobarao, C. K. Subramaniam</i>	
<b>RESONANT GATE DRIVER FOR SERIES OPERATION OF MOSFETS</b> .....	37
<i>S. Krishnaveni, V. Rajini</i>	
<b>TRANSFORMER LESS HIGH VOLTAGE GAIN STEP-UP DC-DC CONVERTER USING CASCODE TECHNIQUE</b> .....	45
<i>N. Krishna Kumari, D. S. G. Krishna, M. Prashanth Kumar</i>	
<b>A NOVEL BUCK – BOOST CONVERTER FED INDUCTION MOTOR TOLERANT TO DEAD-TIME</b> .....	54
<i>M. Sumitha, T. V. Narmadha</i>	
<b>VOLTAGE MODE CONTROL OF INTEGRATED BOOST SERIES PARALLEL FLY-BACK CONVERTER FOR ENERGY STORAGE APPLICATIONS</b> .....	62
<i>S. L. V. Sravan Kumar, Ravi Sankar Reddy N, Vijay Kumar M</i>	
<b>CHARGE CURRENT CONTROLLED SINGLE PHASE INTEGRATED SWITCHED MODE POWER FACTOR CORRECTION CONVERTER</b> .....	71
<i>Mopidevi Subbarao, Ch. Sai Babu, S. Satyanarayana</i>	
<b>ANALYSIS AND DESIGN OF SINGLE PHASE POWER FACTOR CORRECTION USING DC-DC SEPIC CONVERTER WITH BANG-BANG AND PSO BASED FIXED PWM TECHNIQUES</b> .....	79
<i>S. Durgadevi, M. G. Umamaheswari</i>	
<b>PSO-PID MAXIMUM POWER POINT TRACKING CONTROLLER USING MODIFIED SUPERLIFT LUO CONVERTER</b> .....	87
<i>V. Chamundeeswari, R. Seyezhai</i>	
<b>DESIGN AND OPTIMIZATION OF HYBRID MICRO-GRID SYSTEM</b> .....	95
<i>M. Jayachandran, G. Ravi</i>	
<b>VOLTAGE PROFILE IMPROVEMENT OF SOLAR PV GRID – CONNECTED INVERTER WITH MICRO GRID OPERATION USING PI CONTROLLER</b> .....	104
<i>W. J. Praiselin, J. Belwin Edward</i>	
<b>MICRO-GRID GRID OUTAGE MANAGEMENT USING MULTI AGENT SYSTEMS</b> .....	112
<i>Leo Raju, Antony Amalraj Morais, Ramyaa Rathnakumar, P. Soundaryaa, L. D. Thavam</i>	
<b>THREE LEVEL SEPIC FOR HYBRID WIND-SOLAR ENERGY SYSTEMS</b> .....	120
<i>K. Mohanraj, S. Bharathnarayanan</i>	
<b>DEVELOPMENT OF HARDWARE IN LOOP SIMULATION OF GRID CONNECTED PHOTOVOLTAIC SYSTEM</b> .....	128
<i>M. Balamurugan, Sarat Kumar Sahoo</i>	
<b>OPTIMAL ENERGY PERFORMANCE AND COMPARISON OF OPEN RACK AND ROOF MOUNT MONO C-SI PHOTOVOLTAIC SYSTEMS</b> .....	136
<i>Nallapaneni Manoj Kumar, P. Rajesh Kumar Reddy, Kadapalla Praveen</i>	
<b>SOLAR POWERED INDUCTION COOKING SYSTEM</b> .....	145
<i>Bandile I. Sibiyi, Chitra Venugopal</i>	
<b>INTERNAL FALL PROTECTION MECHANISM IN NON-COMPLIANT HUMANOID ROBOT</b> .....	157
<i>Anant Anurag, Hari Om Bansal</i>	
<b>DESIGN OF 15 KW MICRO HYDRO POWER PLANT FOR RURAL ELECTRIFICATION AT VALARA</b> .....	163
<i>Prawin Angel Michael, C. P. Jawahar</i>	

<b>IMPLEMENTATION OF SHUNT ACTIVE FILTER FOR HARMONIC COMPENSATION IN A 3 PHASE 3 WIRE DISTRIBUTION NETWORK</b> .....	172
<i>V. K. Arun Shankar, N. Senthil Kumar</i>	
<b>PERFORMANCE ANALYSIS OF 100 KWP GRID CONNECTED SI-POLY PHOTOVOLTAIC SYSTEM USING PVSYS SIMULATION TOOL</b> .....	180
<i>Nallapaneni Manoj Kumar, M. Rohit Kumar, P. Ruth Rejoice, Mobi Mathew</i>	
<b>APPLICATION OF AGPSO FOR POWER LOSS MINIMIZATION IN RADIAL DISTRIBUTION NETWORK VIA DG UNITS, CAPACITORS AND NR</b> .....	190
<i>G. Srinivasan, S. Visalakshi</i>	
<b>INTERFACE PROTECTION AND ENERGY MANAGEMENT SYSTEM FOR MICROGRID USING INTERNET OF THINGS</b> .....	201
<i>Sri Harsha Nandipati, Penumarthi Tejasvi Babu, Mourya Chigurupati, C. Vaithilingam</i>	
<b>VOLTAGE PROFILE ASSESSMENT IN POWER DISTRIBUTION SYSTEM USING GENERALIZED REGRESSION NEURAL NETWORK</b> .....	209
<i>A. Shinypradeepa, C. Vaithilingam</i>	
<b>ATC EVALUATION IN A DEREGULATED POWER SYSTEM</b> .....	216
<i>Shweta, Vandana Krishnakumar Nair, Valliamadagal Archana Prakash, S Kuruseelan, C. Vaithilingam</i>	
<b>HIGH EFFICIENCY BUCK LED DRIVER USING SIC</b> .....	224
<i>R. Srimathi, Shubhendhu Sitoke, S. Hemamalini</i>	
<b>MULTI-OBJECTIVE OPTIMAL POWER FLOW WITH DG PLACEMENT USING TLBO AND MIPS0: A COMPARATIVE STUDY</b> .....	236
<i>Subhrajyoti Sahu, Ajit Kumar Barisal, Abhishek Kaudi</i>	
<b>A SINGLE PHASE REDUCED DEVICE COUNT MULTILEVEL INVERTER TOPOLOGY USING MCPWM FOR RENEWABLE ENERGY SYSTEMS</b> .....	244
<i>S. Narendiran, Sarat Kumar Sahoo</i>	
<b>A STUDY OF VARIOUS TRACTION TRANSFORMERS &amp; ACTIVE POWER COMPENSATOR IN CO-PHASE TRACTION SYSTEMS</b> .....	252
<i>Abhishek Kaudi, Ajit Kumar Barisal, Subhrajyoti Sahu</i>	
<b>APPLICATION OF SURFACE MODIFIED XLPE NANOCOMPOSITES FOR ELECTRICAL INSULATION OF HIGH VOLTAGE CABLES- PARTIAL DISCHARGE STUDY</b> .....	260
<i>Paramane Ashish Sharad, K. Sathish Kumar</i>	
<b>EFFICIENT POWER MANAGEMENT OF GRID OPERATED MICROGRID USING FUZZY LOGIC CONTROLLER (FLC)</b> .....	268
<i>S. Angalaeswari, O. V. Gnana Swathika, V. Ananthkrishnan, J. L. Febin Daya, K. Jamuna</i>	
<b>THE EFFECT OF DYNAMIC WEATHER CONDITIONS ON THREE TYPES OF PV CELL TECHNOLOGIES – A COMPARATIVE ANALYSIS</b> .....	275
<i>L. Premalatha, N. A. Rahim</i>	
<b>EXPERIMENTAL INVESTIGATION ON PERFORMANCE AND EMISSION CHARACTERISTICS OF A COMMON RAIL DIRECT INJECTIONENGINE USING ANIMAL FAT BIODIESEL BLENDS</b> .....	283
<i>V. K. Shahir, C. P. Jawahar, P. R. Suresh, V. Vinod</i>	
<b>DESIGN AND ANALYSIS OF A PERMANENT MAGNETIC BEARING FOR VERTICAL AXIS SMALL WIND TURBINE</b> .....	291
<i>Premkumar T Micha, T. Mohan, Seralathan Sivamani</i>	
<b>A DUAL CONTROL REGENERATIVE BRAKING STRATEGY FOR TWO-WHEELER APPLICATION</b> .....	299
<i>Siddharth Mehta, S. Hemamalini</i>	
<b>EXPERIMENTAL COMPARISON OF A 70 WATT SWITCHED RELUCTANCE MACHINE WITH DIFFERENT TYPES OF CONVERTER TOPOLOGIES</b> .....	306
<i>Meda Venkata Nitesh, S. Arjun, Shaik Afzal Ahammed, P. Ramesh, N. C. Lenin</i>	
<b>COMPARATIVE ANALYSIS OF BLDC MOTOR FOR DIFFERENT CONTROL TOPOLOGY</b> .....	314
<i>R. Babu Ashok, B. Mahesh Kumar</i>	
<b>EXPERIMENTAL AND THEORETICAL INVESTIGATION OF TRANSIENT VOLTAGE DISTRIBUTION IN AN 11 KV INDUSTRIAL MOTOR WINDING</b> .....	321
<i>M. D. Sajid, B. P. Singh, M. Suryakalavathi</i>	
<b>PHOTOVOLTAIC BASED SERIES Z-SOURCE INVERTER FED INDUCTION MOTOR DRIVE WITH IMPROVED SHOOT THROUGH TECHNIQUE</b> .....	329
<i>Rahul Adle, Mohan Renge, Shubhada Muley, Purushottam Shobhane</i>	
<b>COMPARATIVE ANALYSIS OF MODIFIED MULTILEVEL DC LINK INVERTER WITH CONVENTIONAL CASCADED MULTILEVEL INVERTER FED INDUCTION MOTOR DRIVE</b> .....	336
<i>T. Poompavai, P. Vijaya Priya</i>	

<b>PARAMETER ESTIMATION AND SPEED CONTROL OF A PMDC MOTOR USED IN WHEELCHAIR.....</b>	<b>345</b>
<i>V. Sankardoss, P. Geethanjali</i>	
<b>SPACE VECTOR BASED RANDOM PWM ALGORITHMS FOR ACOUSTIC NOISE AND HARMONICS REDUCTION FOR VOLTAGE SOURCE INVERTER FED AC DRIVE .....</b>	<b>353</b>
<i>M. Nayeemuddin, T. Bramhananda Reddy, M. Vijaya Kumar</i>	
<b>IMPROVED PERFORMANCE OF MODULAR MULTILEVEL CONVERTER FOR INDUCTION MOTOR DRIVE.....</b>	<b>361</b>
<i>Preeti V. Kapoor, Mohan M. Renge</i>	
<b>DYNAMIC MODELING OF SEVEN-PHASE INDUCTION GENERATOR .....</b>	<b>369</b>
<i>C. Kalaivani, K. Rajambal</i>	
<b>A SIMPLIFIED FILTER TOPOLOGY FOR COMPENSATING COMMON MODE VOLTAGE AND ELECTROMAGNETIC INTERFERENCE IN INDUCTION MOTOR DRIVES.....</b>	<b>377</b>
<i>A. Bhakthavachala, S. Tara Kalyani, K. Anuradha</i>	
<b>PERFORMANCE EVALUATION OF PMSG FOR AIRCRAFT APPLICATIONS .....</b>	<b>385</b>
<i>Deepak Arumugam, Premalatha Logamani, Santha Karuppiah, Bharathi Thangaraj</i>	
<b>AN ANN BASED SPO2 MEASUREMENT FOR CLINICAL MANAGEMENT SYSTEMS .....</b>	<b>393</b>
<i>Garima P Gupta, Rajashree R Nair, R Jeyanthi</i>	
<b>FUZZY BASED CLUSTERING OF SMART METER DATA USING REAL POWER AND THD PATTERNS.....</b>	<b>401</b>
<i>M. Muthamizh Selvam, R. Gnanadass, N. P. Padhy</i>	
<b>FUZZY SELF TUNING PI CONTROLLER BASED INVERTER CONTROL FOR VOLTAGE REGULATION IN OFF-GRID HYBRID POWER SYSTEM .....</b>	<b>409</b>
<i>Harsha Anantwar, B R Lakshmikantha, Shanmukha Sundar</i>	
<b>COMBINED MATHEMATICAL MORPHOLOGY AND DATA MINING BASED HIGH IMPEDANCE FAULT DETECTION .....</b>	<b>417</b>
<i>Kavaskar Sekar, Nalin Kant Mohanty</i>	
<b>ANN BASED ASSISTANCE FOR EXERCISE PATTERNS USING ACCELEROMETER DATA .....</b>	<b>424</b>
<i>Ritesh Tekriwal, B. Jaganatha Pandian</i>	
<b>ADAPTIVE GENETIC ALGORITHM BASED MULTI-OBJECTIVE OPTIMIZATION FOR PHOTOVOLTAIC CELL DESIGN PARAMETER EXTRACTION .....</b>	<b>432</b>
<i>P. Ashwini Kumari, P. Geethanjali</i>	
<b>SEQUENTIAL CIRCUIT DESIGN USING QUANTUM-DOT CELLULAR AUTOMATA .....</b>	<b>442</b>
<i>Namita, Trailokya Nath Sasamal</i>	
<b>AN OPTIMAL DESIGN OF 2-TO-4 DECODER CIRCUIT IN COPLANAR QUANTUM-DOT CELLULAR AUTOMATA .....</b>	<b>450</b>
<i>Mohit Kumar, Trailokya Nath Sasamal</i>	
<b>PHOTOVOLTAIC BASED DVR WITH POWER QUALITY DETECTION USING WAVELET TRANSFORM .....</b>	<b>458</b>
<i>D. Divyalakshmi, N. P. Subramaniam</i>	
<b>A NEW CLOCKING SCHEME FOR QUANTUM-DOT CELLULAR AUTOMATA BASED DESIGNS WITH SINGLE OR REGULAR CELLS.....</b>	<b>466</b>
<i>Suman Rani, Trailokya Nath Sasamal</i>	
<b>CHALLENGES FACED AND SOLUTIONS FOR NETWORK MODELLING AND IMPLEMENTATION OF STATE ESTIMATOR AT NORTHERN REGIONAL LOAD DESPATCH CENTRE, INDIA.....</b>	<b>474</b>
<i>Aman Bansal, Ankur Gulati, Rajiv Kumar Porwal, Debasis De, P K Agarwal</i>	
<b>REACTIVE POWER REALLOCATION IN THE DISTRIBUTION SYSTEM WITH DSTATCOM.....</b>	<b>485</b>
<i>B. Muruganantham, R. Gnanadass, N. P. Padhy</i>	
<b>IMPLEMENTATION OF GENETIC ALGORITHM BASED ADDITIVE AND DIVISIVE CLUSTERING TECHNIQUES FOR UNIT COMMITMENT.....</b>	<b>493</b>
<i>G. V. Subba Reddy, V. Ganesh, C. Srinivasa Rao</i>	
<b>COST EFFECTIVE INTEGRATED MAINTENANCE SCHEDULING IN POWER SYSTEMS USING ANT LION OPTIMIZER .....</b>	<b>501</b>
<i>E. Umamaheswari, S. Ganesan, M. Abirami, S. Subramanian</i>	
<b>ECONOMIC GENERATION SCHEDULE ON THERMAL POWER SYSTEM CONSIDERING EMISSION USING GREY WOLVES OPTIMIZATION .....</b>	<b>509</b>
<i>Kalyan Sagar Kadali, L. Rajaji, V. Moorthy, J. Viswanatharao</i>	
<b>DESIGN AND IMPLEMENTATION OF AN ALGORITHM FOR DIAGNOSIS OF LOAD ENCROACHMENT IN EHV LINES .....</b>	<b>519</b>
<i>K. K. Jithin, S. Venkata Hareesh, P. Raja, M. P. Selvan</i>	

<b>ADAPTIVE DESIGN OF DISTANCE RELAY FOR SERIES COMPENSATED TRANSMISSION LINE</b> .....	527
<i>K. Sujita Kumar Achary, P. Raja</i>	
<b>REAL-TIME VALIDATION OF A ROBUST LQG BASED DECENTRALIZED SUPPLEMENTARY CONTROL LOOP TO MITIGATE INSTABILITY IN AN ISLANDED AC MICROGRID</b> .....	535
<i>Esn Raju P, Trapti Jain</i>	
<b>ZIEGLER NICHOLS METHOD BASED ROBUST REACTIVE CURRENT CONTROLLER FOR STATCOM</b> .....	543
<i>Dinesh Shetty, Nagesh Prabhu</i>	
<b>ANALYSIS AND PERFORMANCE EVALUATION OF TYPE 1 FUZZY REACTIVE CURRENT CONTROLLER WITH STATCOM</b> .....	551
<i>Dinesh Shetty, Nagesh Prabhu</i>	
<b>IMPACT OF SSSC-ES ON BIFURCATIONS OF SSR</b> .....	559
<i>R. C. Mala, Nagesh Prabhu, H. V. Gururaja Rao</i>	
<b>PROFIT MAXIMIZATION OF HYBRID SYSTEM UNDER AVAILABILITY BASED TARIFF IN DEREGULATED ENVIRONMENT</b> .....	567
<i>M. Bhavani, K. Selvi, O. Supriya</i>	
<b>OPTIMAL PLACEMENT OF STATCOM USING TWO STAGE ALGORITHM FOR ENHANCING POWER SYSTEM STATIC SECURITY</b> .....	575
<i>V. Srinivasa Rao, R. Srinivasa Rao</i>	
<b>MULTI VERSE OPTIMIZATION (MVO) TECHNIQUE BASED VOLTAGE STABILITY ANALYSIS THROUGH CONTINUATION POWER FLOW IN IEEE 57 BUS</b> .....	583
<i>K. Karthikeyan, P. K. Dhal</i>	

## PART 2

<b>PV FED ASYMMETRICAL SWITCHED DIODE MULTI LEVEL INVERTER WITH MINIMUM NUMBER OF POWER ELECTRONIC COMPONENTS</b> .....	592
<i>M. Arun Noyal Doss, R. Naveenkumar, R. Ravichandran, J. Rengaraj, M. Manikandan</i>	
<b>LOAD SHARING CONTROL OF PARALLEL OPERATED SINGLE PHASE INVERTERS</b> .....	600
<i>P. Monica, M. Kowsalya, P. C. Tejaswi</i>	
<b>MODELING AND OPERATION OF A VANADIUM REDOX FLOW BATTERY FOR PV APPLICATIONS</b> .....	607
<i>Amjed Hina Fathima, Kaliannan Palanisamy</i>	
<b>DESIGN AND MATLAB/SIMULINK IMPLEMENTATION OF FOUR SWITCH INVERTER FOR MICROGRID UTILITIES</b> .....	615
<i>V V Vijetha Inti, V. S. Vakula</i>	
<b>HYBRID MULTILEVEL DC LINK INVERTER WITH REDUCED POWER ELECTRONIC SWITCHES</b> .....	626
<i>G Durga Prasad, V Jegathesan, P V V Rama Rao</i>	
<b>PERFORMANCE EVALUATION OF CARRIER BASED PWM TECHNIQUES FOR HYBRID MULTILEVEL INVERTERS WITH REDUCED NUMBER OF COMPONENTS</b> .....	635
<i>N. Susheela, P. Satish Kumar</i>	
<b>CURRENT CONTROL OF GRID TIED INVERTER THROUGH SHEPWM METHOD</b> .....	643
<i>Sarika D Patil, Sumant G Kadwane, Snehal P Gawande</i>	
<b>DESIGN OF AN EFFICIENT POSITIVE OUTPUT SELF-LIFT AND NEGATIVE OUTPUT SELF-LIFT LUO CONVERTERS USING DRIFT FREE TECHNIQUE FOR PHOTOVOLTAIC APPLICATIONS</b> .....	651
<i>S Amirtharaj, L Premalatha</i>	
<b>MODEL PREDICTIVE CURRENT CONTROL OF SINGLE PHASE SHUNT ACTIVE POWER FILTER</b> .....	658
<i>K. Rameshkumar, V. Indragandhi, K. Palanisamy, T. Arunkumari</i>	
<b>COMPARISON OF PWM TECHNIQUES FOR A THREE LEVEL MODULAR MULTILEVEL INVERTER</b> .....	666
<i>M. Mohan Harin, V. Vanitha, M. Jayakumar</i>	
<b>3- SWITCH SINGLE-PHASE INVERTER FOR PV SYSTEM</b> .....	674
<i>V. Birunda Mary, I. William Christopher, G. Themozhi</i>	
<b>PHOTOVOLTAIC BASED LED LIGHTING WITH MAXIMUM POWER POINT TRACKING</b> .....	682
<i>Uday B. Mujumdar, D. R. Tutkane</i>	

<b>OPTIMAL SIZING OF STANDALONE PV/WIND/BIOMASS HYBRID ENERGY SYSTEM USING GA AND PSO OPTIMIZATION TECHNIQUE .....</b>	<b>690</b>
<i>Yashwant Sawle, S. C. Gupta, Aashish Kumar Bohre</i>	
<b>ANALYSIS OF EFFECTIVENESS OF SSSC IN TRANSMISSION NETWORK USING PI CONTROLLED TECHNIQUE.....</b>	<b>699</b>
<i>Alok Jain, Lokesh Kumar Yadav, Ankur Omer, Suman Bhullar</i>	
<b>CASCADE PID-LEAD COMPENSATOR CONTROLLER FOR NON-OVERSHOOT TIME RESPONSES OF UNSTABLE SYSTEM.....</b>	<b>708</b>
<i>E. Govinda Kumar, E. Gowthaman</i>	
<b>ANALYSIS, DESIGN AND IMPLEMENTATION OF SINGLE PHASE SRF CONTROLLER FOR DYNAMIC VOLTAGE RESTORER UNDER DISTORTED SUPPLY CONDITION .....</b>	<b>716</b>
<i>D. N. Katole, M. B. Daigavane, S. P. Gawande, P. M. Daigavane</i>	
<b>A PRACTICAL INVESTIGATION ON CONSERVATION VOLTAGE REDUCTION FOR ITS EFFICIENCY WITH ELECTRIC HOME APPLIANCES .....</b>	<b>724</b>
<i>A. Singaravelan, M. Kowsalya</i>	
<b>STABILIZATION AND CONTROL OF CHAOS BASED ON NONLINEAR DYNAMIC INVERSION .....</b>	<b>731</b>
<i>Moumita Mukherjee, Suman Halder</i>	
<b>BATTERY STATE ESTIMATION USING AC ANALYSIS .....</b>	<b>739</b>
<i>Madhuri Bayya, Bvssn Prabhakara Rao, U. M. Rao, N. Moorthy</i>	
<b>DSSC: A DISTRIBUTED POWER FLOW CONTROLLER .....</b>	<b>745</b>
<i>S. R. Gaigowal, M. M. Renge</i>	
<b>FAULT TOLERANT SINGLE SWITCH PWM DC-DC CONVERTERS FOR BATTERY CHARGING APPLICATIONS.....</b>	<b>753</b>
<i>S. Gowtham, M. Balaji, S. Harish, M. S. Abraham Pinto, G. Jagadeesh</i>	
<b>APPROXIMATION AND OPTIMIZATION OF DISCRETE SYSTEMS USING ORDER REDUCTION TECHNIQUE.....</b>	<b>761</b>
<i>K. Ramesh, R. Girish Ganesan, K. Mahalakshmi</i>	
<b>SMALL SIGNAL STABILITY ANALYSIS OF GRID CONNECTED RENEWABLE ENERGY RESOURCES WITH THE EFFECT OF UNCERTAIN WIND POWER PENETRATION .....</b>	<b>769</b>
<i>S. Grace Sadhana, S. Ashok, S. Kumaravel</i>	
<b>AN EFFICIENT ASYMMETRICAL 15-LEVEL SMART INVERTER TOPOLOGIES FOR MICRO-GRID SYSTEM USING PSO-PID TUNING ALGORITHM .....</b>	<b>777</b>
<i>P. Hemachandu, V. C. Veera Reddy</i>	
<b>UP AND DOWN CONVERSION OF PHOTONS WITH MODIFIED PERTURB AND OBSERVE MPPT TECHNIQUE FOR EFFICIENT SOLAR ENERGY GENERATION .....</b>	<b>786</b>
<i>Atul Manmohan, Akhil Prasad, Ravi Dharavath, S. Prabhakar Karthikeyan, I. Jacob Raglend</i>	
<b>PSPWM BASED FIVE-LEVEL SHUNT ACTIVE FILTER FOR POWER QUALITY IMPROVEMENT IN POWER SYSTEM NETWORK .....</b>	<b>794</b>
<i>R. Sheba Rani, C. Srinivasa Rao, M. Vijaya Kumar</i>	
<b>DESIGN AND DEVELOPMENT OF SELF TUNING CONTROLLER FOR TCSC TO DAMP INTER HARMONIC OSCILLATION.....</b>	<b>802</b>
<i>M. Dilip Kumar, P. Sujatha</i>	
<b>PERFORMANCE IMPROVEMENTS IN OPEN END WINDING INDUCTION MOTOR DRIVE USING DECOUPLED PWM TECHNIQUES .....</b>	<b>810</b>
<i>M. Ranjit, T. Brahmananda Reddy, M. Suryakalavathi</i>	
<b>DESIGN OF DIVIDER USING TAYLOR SERIES IN QCA.....</b>	<b>818</b>
<i>Awanish Kumar, Trailokya Nath Sasamal</i>	
<b>CUCKOO SEARCH ALGORITHM FOR OPTIMAL TRANSMISSION EXPANSION PLANNING WITH VARIOUS LOAD MODELS AND FFC.....</b>	<b>826</b>
<i>K. Veeresham, K. Vaisakh, M. Veerakumari</i>	
<b>SMALL SIGNAL MODELING OF A DC-DC TYPE DOUBLE BOOST CONVERTER INTEGRATED WITH SEPIC CONVERTER USING STATE SPACE AVERAGING APPROACH .....</b>	<b>835</b>
<i>G. Kanimozhi, J. Meenakshi, V. T. Sreedevi</i>	
<b>FORWARD ERROR CORRECTION BASED ENCODING TECHNIQUE FOR CROSS-LAYER MULTI CHANNEL MAC PROTOCOL.....</b>	<b>847</b>
<i>K. Vikram, Sarat Kumar Sahoo, K. Venkata Lakshmi Narayana</i>	
<b>SIMULATED ANNEALING BASED SELECTIVE HARMONIC ELIMINATION FOR MULTI-LEVEL INVERTER.....</b>	<b>855</b>
<i>N. Vinoth Kumar, V. Kumar Chinnaian, M Pradish, S. Prabhakar Karthikeyan</i>	

<b>FIVE-LEVEL DIODE CLAMPED MULTILEVEL INVERTER (DCMLI) BASED ELECTRIC SPRING FOR SMART GRID APPLICATIONS .....</b>	<b>862</b>
<i>Rutuja Pawar, S. P. Gawande, S. G. Kadwane, M. A. Waghmare, R. N. Nagpure</i>	
<b>AN IMPROVED TECHNIQUE FOR PREDICTING CHARACTERISTICS OF TWO-DIODE BASED PV MODEL.....</b>	<b>870</b>
<i>R. S. Sangeetha, M. V. Jayan, M Pradish</i>	
<b>COMBINED TUNING OF SECONDARY CONTROLLER ALONG WITH ENERGY STORAGE DEVICES IN A MULTI AREA INTERCONNECTED POWER SYSTEM.....</b>	<b>878</b>
<i>Ch. Durga Prasad, G. Pavan Kumar, D. J. V. Prasad, N. Srinivasu, M. Sai Veerraju</i>	
<b>CHATTERING REDUCTION IN SLIDING MODE CONTROL OF QUADCOPTERS USING NEURAL NETWORKS .....</b>	<b>885</b>
<i>N. Cibiraj, M. Varatharajan</i>	
<b>PMU PLACEMENT FOR MAXIMUM OBSERVABILITY OF POWER SYSTEM UNDER DIFFERENT CONTINGENCIES .....</b>	<b>893</b>
<i>Satyendra P. Singh, Amit K. Thakur, S. P. Singh</i>	
<b>DESIGN AND DEVELOPMENT OF A SPEECH THERAPY MODULE USING SIGNAL PROCESSING TECHNIQUES .....</b>	<b>901</b>
<i>P. Mahalakshmi, Ritwik Dhawan, Ujjwal Ashish, A. Sharmila</i>	
<b>FUZZY CONTROLLED SWITCHED CAPACITOR BOOST INVERTER .....</b>	<b>909</b>
<i>P Ponnambalam, K Muralikumar, P Vasundhara, S Sreejith, Babu Challa</i>	
<b>A NEW TOPOLOGY FOR CASCADED H-BRIDGE MULTILEVEL INVERTER WITH PI AND FUZZY CONTROL.....</b>	<b>917</b>
<i>C. Kannan, Nalin Kant Mohanty, R. Selvarasu</i>	
<b>REAL TIME IMPLEMENTATION OF QUAZI Z-SOURCE INVERTER INCORPORATED WITH RENEWABLE ENERGY SOURCE .....</b>	<b>927</b>
<i>R. Sathishkumar, V. Malathi, E. Sakthivel</i>	
<b>MODEL BASED FAULT DETECTION AND DIAGNOSIS OF DOUBLY FED INDUCTION GENERATORS – A REVIEW .....</b>	<b>935</b>
<i>A. Balasubramanian, Ranganath Muthu</i>	
<b>ZERO DIRECT-AXIS CURRENT (ZDC) CONTROL FOR VARIABLE SPEED WIND ENERGY CONVERSION SYSTEM USING PMSG .....</b>	<b>943</b>
<i>Dhanashree K. Porate, S. P. Gawande, A. P. Munshi, K. B. Porate, S. G. Kadwane, M. A. Waghmare</i>	
<b>CONVERTER CONTROL STRATEGY FOR TORQUE RIPPLE MINIMIZATION IN BLDC MOTOR .....</b>	<b>951</b>
<i>N. Mohanraj, R. Sankaran</i>	
<b>PERFORMANCE COMPARISON OF MULTILEVEL INVERTER TOPOLOGIES FOR CLOSED LOOP V/F CONTROLLED INDUCTION MOTOR DRIVE .....</b>	<b>958</b>
<i>A Chitra, Razia Sultana. W, J. Vanishree, S. Sreejith, Sherin Jose, Alphons J Pulickan</i>	
<b>FIELD ORIENTED CONTROL OF SPACE VECTOR MODULATED MULTILEVEL INVERTER FED PMSM DRIVE .....</b>	<b>966</b>
<i>Jose Jacob, A. Chitra</i>	
<b>A MATLAB BASED PV MODULE MODELS ANALYSIS UNDER CONDITIONS OF NONUNIFORM IRRADIANCE .....</b>	<b>974</b>
<i>G. Sreenivasa Reddy, T. Bramhananda Reddy, M. Vijaya Kumar</i>	
<b>AN INTEGRATED BOOST-SEPIC-CUK DC-DC CONVERTER WITH HIGH VOLTAGE RATIO AND REDUCED INPUT CURRENT RIPPLE.....</b>	<b>984</b>
<i>Manish Kumar, M Ashirvad, Y Narendra Babu</i>	
<b>A NOVEL BRIDGELESS SEPIC CONVERTER FOR POWER FACTOR CORRECTION.....</b>	<b>991</b>
<i>R. Meenadevi, L. Premalatha</i>	
<b>VOLTAGE STABILITY IMPROVEMENT IN MULTI-BUS SYSTEM USING STATIC SYNCHRONOUS SERIES COMPENSATOR .....</b>	<b>999</b>
<i>D. A. Ingole, Prof. V. N. Gohokar</i>	
<b>THYRISTOR SWITCHED SMART TRANSFORMER FOR ACTIVE POWER FLOW CONTROL IN MULTI MICRO GRID SYSTEM.....</b>	<b>1007</b>
<i>V. C. Jishnu Sankar, G. Haritha, G. Nair Manjula</i>	
<b>DESIGN OPTIMISATION FOR AN EFFICIENT WIRELESS POWER TRANSFER SYSTEM FOR ELECTRIC VEHICLES.....</b>	<b>1015</b>
<i>Soham Chatterjee, Archana Iyer, C. Bharatiraja, Ishan Vaghasia, Valiveti Rajesh</i>	
<b>A HYBRID CASCADED MULTILEVEL INVERTER WITH DIODE ASSISTED BOOSTING NETWORK.....</b>	<b>1024</b>
<i>C. Bharatiraja, Aishwarya Ravi, Sanchari Banerjee, Abhishek Chakraborty, Anirudh Anupam, Akshay Menon</i>	



<b>INTERNAL MODEL BASED LOAD FREQUENCY CONTROLLER DESIGN FOR HYBRID MICROGRID SYSTEM</b> .....	1032
<i>A. Jeya Veronica, N. Senthil Kumar</i>	
<b>ANALYSIS OF ISOLATED HYBRID SYSTEM FOR POWER SUPPLY TO A REMOTE ISLAND</b> .....	1040
<i>Sasmita Behera, Shobhit Nandkeolyar</i>	
<b>EL-PSO BASED MPPT FOR SOLAR PV UNDER PARTIAL SHADED CONDITION</b> .....	1047
<i>Pratik Shantaram Gavhane, Smriti Krishnamurthy, Ridhima Dixit, J. Prasanth Ram, N. Rajasekar</i>	
<b>MODELLING OF ORGANIC PHOTOVOLTAIC CELLS BASED ON AN IMPROVED REVERSE DOUBLE DIODE MODEL</b> .....	1054
<i>Dhanup S. Pillai, Bidyutprava Sahoo, J. Prasanth Ram, Antonino Laudani, N. Rajasekar, N. Sudhakar</i>	
<b>SOLAR PV ARRAY RECONFIGURATION USING THE CONCEPT OF STANDARD DEVIATION AND GENETIC ALGORITHM</b> .....	1062
<i>Naik Aashay Rajan, Kulkarni Devendra Shrikant, B. Dhanalakshmi, N. Rajasekar</i>	
<b>COMPARATIVE STUDY ON CHARGE CONTROLLER TECHNIQUES FOR SOLAR PV SYSTEM</b> .....	1070
<i>M. Lokeshreddy, P. J. R. Pavan Kumar, S. Aneel Manik Chandra, T. Sudhakar Babu, N. Rajasekar</i>	
<b>FUZZY DECISION AND GRAPH ALGORITHMS AIDED ADAPTIVE PROTECTION OF MICROGRID</b> .....	1078
<i>O. V. Gnana Swathika, S. Angalaeswari, V. Anantha Krishnan, K. Jamuna, J. L. Febin Daya</i>	
<b>OPTIMAL POWER FLOW USING HYBRID DA-APSO ALGORITHM IN RENEWABLE ENERGY RESOURCES</b> .....	1085
<i>C. Shilaja, K. Ravi</i>	
<b>FUNDAMENTAL SEQUENCE COMPONENT BASED HYSTERESIS CURRENT CONTROLLED MSALC</b> .....	1093
<i>G. Muralikrishnan, N. K. Mohanty</i>	
<b>SPEED CONTROL OF PERMANENT MAGNET BRUSHLESS DC MOTOR USING HYBRID FUZZY PROPORTIONAL PLUS INTEGRAL PLUS DERIVATIVE CONTROLLER</b> .....	1101
<i>E. Gowthaman, V. Vinodhini, Mir Yasser Hussain, S. K. Dhinakaran, T. Sabarinathan</i>	
<b>ONLINE AUTO SELECTION OF TUNING METHODS AND AUTO TUNING PI CONTROLLER IN FOPDT REAL TIME PROCESS-PH NEUTRALIZATION</b> .....	1109
<i>Naregalkar Akshay, D. Subbulekshmi</i>	
<b>A HYBRID STATE ESTIMATOR USING CURRENT BASED ESTIMATOR AND PMU MEASUREMENTS</b> .....	1117
<i>S. P. Noopura, M. V. Jayan</i>	
<b>FRACTIONAL ORDER IMC BASED PID CONTROLLER DESIGN USING NOVEL BAT OPTIMIZATION ALGORITHM FOR TITO PROCESS</b> .....	1125
<i>S. K. Lakshmanaprabu, U. Sabura Banu, P. R. Hemavathy</i>	
<b>PV INTEGRATED SHUNT ACTIVE FILTER FOR HARMONIC COMPENSATION</b> .....	1134
<i>S. Srinath, S. Poongothai, T. Aruna</i>	
<b>AN EXPERIMENTAL INVESTIGATION OF PROXIMITY EFFECT OF PIPE CONDUCTOR CONTAINING INSULATION CONDUCTORS</b> .....	1145
<i>Asha Shendge</i>	
<b>INVESTIGATION OF GATE DRIVE STRATEGIES FOR HIGH VOLTAGE GAN HEMTS</b> .....	1152
<i>Nikita Hari, Teng Long, Edward Shelton</i>	
<b>FUZZY BASED CONTROLLER FOR LIDAR SENSOR OF AN AUTONOMOUS VEHICLE</b> .....	1160
<i>Ankit Kumar Singh, Abhisek Negi, Smak Azad, Sangram Mudali</i>	
<b>INRUSH BLOCKING SCHEME IN TRANSFORMER DIFFERENTIAL PROTECTION</b> .....	1165
<i>Balamurugan Saravanan, A. Rathinam</i>	
<b>PHASOR MEASUREMENT UNIT BASED WIDE AREA BACKUP PROTECTION SCHEME FOR POWER TRANSMISSION LINES</b> .....	1172
<i>A. Rathinam, S. Vanila, Ch. Harika</i>	
<b>HIGH STEP-UP DC-DC CONVERTER WITH REDUCED SWITCH STRESS AND LOW INPUT CURRENT RIPPLE</b> .....	1182
<i>S. Kalaimaran, Sri B. Revathi, M. Prabhakar</i>	
<b>Author Index</b>	