

2020 2nd Global Power, Energy and Communication Conference (GPECOM 2020)

**Izmir, Turkey
20-23 October 2020**



**IEEE Catalog Number: CFP20R15-POD
ISBN: 978-1-7281-6265-2**

**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:	CFP20R15-POD
ISBN (Print-On-Demand):	978-1-7281-6265-2
ISBN (Online):	978-1-7281-6264-5

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

Voltage Stability Enhancement Using a Novel Active Power Filter System <i>R. Dehini, A. Gencer, and G. Hachemi</i>	1
Two-Stage Flyback Micro Inverter for Solar Power Conversion <i>A. Boyar and E. Kabalci</i>	6
An Interleaved Flyback Micro Inverter with H5 Topology for Photovoltaic Applications <i>E. Kabalci and A. Boyar</i>	12
Comparative Performance Assessment of Hysteresis and Constant Switching Frequency DTC over AC Machines <i>G. Ketenci and M. Karabacak</i>	18
An Experimental Assessment of Predictive Current Control for Nine-Switch Inverter <i>O. Gulbudak and M. Gokdag</i>	24
FPGA-Based Model Predictive Control for Power Converters <i>O. Gulbudak and M. Gokdag</i>	30
A New Mathematical Expression for Mutual Inductance of Two Coupled Ring Coils <i>S. Al-Chlaihawi, S. Valtchev, and E. Kabalci</i>	36
DC-DC X-Converter Comparison with Buck Boost Converter with Proposed Controller <i>A. Algamluoli, H. M. Abdulhadi, and A. F. Algamluoli</i>	41
Novel Hybrid High Gain Converter: Combination of Cuk and Buck-Boost Structures with Switched Inductor for DC Microgrid <i>N. Gupta, D. Almakhles, M. S. Bhaskar, P. Sanjeevikumar, J. B. Holm-Nielsen and M. Mitolo</i>	47
Online Parameter Estimation of a Lithium-Ion Battery based on Sunflower Optimization Algorithm <i>E. Mouncef, B. Mostafa, and E. Naouef</i>	53
V2G Applicable Electric Vehicle Chargers, Power Converters & Their Controllers: A Review <i>G. B. Sahinler and G. Poyrazoglu</i>	59
D-Statcom-Fuel Cell Energy Control System Based on Instantaneous Reactive Power Theory <i>R. Dehini, A. Gencer, and G. Hachemi</i>	65
Stress Analysis Based on Semiconductor Equivalent Circuit Model in Flyback Converters <i>A. Pekdemir and A. B. Yildiz</i>	71

Speed Control of DC Motor Under Load Condition Using Single Phase Matrix Converter <i>M. Boydak, A. Orhan, and A. Caliskan</i>	76
Application of Calorimetric Technique for Wide Bandgap Transistor Loss Assessment <i>K. Kroics and V. S. Mainyani</i>	81
Decentralized Space Vector PWM Method for Multilevel Multiphase Converters <i>Q. D. Phan and P. C. Nguyen</i>	87
Speed Control of DC Motor Using Single Phase Matrix Converter <i>M. Boydak, A. Orhan, and A. Caliskan</i>	93
Analysis of Switched Capacitor Circuits Based on Unified Ideal Switch Model <i>G. Birtek and A. B. Yildiz</i>	98
A New Transformerless Single-Phase Eleven-Level Inverter with Reduction of Switches Based on Model Predictive Control Method <i>B. Rooholahi</i>	102
Distributed Hierarchical Control for Proportional Current Sharing in PV Systems <i>A. Calpinici, E. Irmak, and E. Kabalci</i>	108
Speed-Sensorless Finite Control Set Model Predictive Control of PMSM with Permanent Magnet Flux Linkage Estimation <i>E. Zerdali and P. Wheeler</i>	114
Speed Control of DC Motor Based on Tuning Pole Placement Using Enhanced PSO <i>A. F. Algamluoli, H. M. Abdulhadi, and H. A. Hasan</i>	120
Evaluation of Eddy Current Losses in the Cooling Sleeve of a Toroidal High Speed Permanent Magnet Machine <i>F. Ferrucci, M. Merdzan, F. G. Capponi, and E. Lomonova</i>	125
Servo Brake Control based on Finite Control Set–Model Predictive Control with a Voltage Smoother <i>H. Kawai, J. Cordier, R. Kennel, and S. Doki</i>	131
Adaptive Nonlinear Controller for the Trajectory Tracking of the Quadrotor with Uncertainties <i>A. Benaddy, M. Labbadi, and M. Bouzi</i>	137
The Impact of Electric Vehicle Charging Stations on Power Distribution Grid by Statistical and Probabilistic Simulation <i>D. Keser and G. Poyrazoglu</i>	143
Design and Optimization of Permanent Magnet Synchronous Motor for Electric Vehicle Applications <i>A. H. Levent, A. Lordoglu, and M. G. Aydeniz</i>	148

A Method for Real-Time Sensorless Speed Control of Brushed DC Motors in Cost Constrained System <i>D. Ertl and L. Weber</i>	152
Cobalt Iron Core Impact on Optimal Design of an Interior Permanent Magnet Synchronous Motor for Competition Electric Vehicle <i>P. P. C. Bhagubai, A. C. Cardoso, and J. F. P. Fernandes</i>	158
Design of IPMSM with Reduced Torque Ripple Through Advanced Sine-Shaped Poles <i>M. M. Lumertz, A. G. de Castro, S. T. C. A. dos Santos, M. L. de Aguiar, and J. R. B. A. Monteiro</i>	164
Speed-Sensorless FCS-PTC Based Induction Motor Drive Capable of Disturbance Rejection <i>E. Zerdali, R. Demir, and M. Barut</i>	170
Improving the Torque Ripple with an Axial and Solid Double-Inner-Rotor Configuration in PM Flux Switching Generators <i>J. L. Silva, F. F. da Silva, J. F. P. Fernandes, and P. J. C. Branco</i>	176
Speed Estimation of Vector Controlled Three-Phase Induction Motor Under Four-Quadrant Operation Using Stator Currents and Voltages <i>S. Ozdemir</i>	182
Load-Torque Estimation Under Four-Quadrant Operation of Vector Controlled Three-Phase Induction Motor Using Stator Current and Voltages <i>S. Ozdemir</i>	187
Efficient Modelling for Analysis of Magnetically Controlled Saturable Reactor <i>B. Sabunucu and A. B. Yildiz</i>	192
Stability Issues with Inverter Loads and Their Control in Low Inertia Islanded Microgrids <i>N. Beg, H. Biechl, and A. Rosin</i>	196
Damping Based Relative Stability Regions in Load Frequency Control System with Plug-in Electric Vehicles and Communication Delays <i>A. Naveed, S. Sonmez, and S. Ayasun</i>	202
A Generalized Control Strategy for DC-DC Converters used in DC Microgrid with SWT, PV and FC <i>A. Dali, S. Abdelmalek, A. Gencer, A. Bakdi, and M. Bettayeb</i>	208
Economic Evaluation of Dynamic Thermal Rating Under Variable Loading Conditions for The Flexibility of Power Systems with Wind Power Plants <i>O. Gul and T. Ulker</i>	214
Optimal Battery Sizing in Micro-grid by Linear Programming <i>G. Poyrazoglu, B. A. Taskiran, and N. Kayabolen</i>	220
Solar PV Power Forecasting Using Modified SVR with Gauss-Newton Method <i>P. Pawar, N. Mithulanathan, and M. Q. Raza</i>	226

Tuning of Controller Parameters for Time-Delayed Micro-Grid System Including Electric Vehicle <i>H. Gunduz, S. Sonmez, and S. Ayasun</i>	232
Bringing ROCOF into spotlight in Smart Grids: new standardization and UFLS method <i>A. Bonetti, J. Zakonjsek, and U. Rudez</i>	238
Single Dual Setting Directional Over-Current Relay Based Line Protection Logic for Distributed Generation Integrated Power Systems <i>I. Evkay, S. Ashraf, M. Baysal, U. S. Selamogullari, and O. Hasan</i>	245
Risk Assessment by Using Failure Modes and Effects Analysis (FMEA) Based on Power Transformer Aging for Maintenance and Replacement Decision <i>O. H. Eyuboglu, B. Dindar, and O. Gul</i>	251
Series Resonance Type Fault Current Limiter for Fault Current Limitation and Voltage Sag Mitigation in Electrical Distribution Network <i>O. H. Eyuboglu, B. Dindar, and O. Gul</i>	256
Fault Operating Condition of Modular Multilevel Converter-Based HVDC Using Lyapunov Method Compensators <i>M. Mehrasa, N. Beheshti, M. Rezanejad, G. G. Farivar, J. Pou, S. Bacha, and A. Hably</i>	262
DC-Link Voltage Stability-Based Control Strategy for Grid-Connected Hybrid AC/DC Microgrid <i>A. Zafari, M. Mehrasa, K. Rouzbehi, M. S. Sadabadi, S. Bacha, and A. Hably</i>	268
Least Square Method for Impedance Based Fault Location in Ungrounded Networks <i>T. Namas and I. Dzafic</i>	274
A Stochastic Simulation for a Hybrid System of Solar Panels and EV Chargers <i>B. C. Hasdemir, D. Acikgoz, and G. Poyrazoglu</i>	279
Prediction Algorithm & Learner Selection for European Day-Ahead Electricity Prices <i>T. Ulgen, A. E. Sayed, and G. Poyrazoglu</i>	285
Use of Smart Inverters for Provision of Voltage Support to Medium and High Voltage Networks <i>M. J. Parajeles, R. Ramirez, and G. Valverde</i>	291
Intentional Islanding of Electricity Grids Using Binary Genetic Algorithm <i>A. Ivanova, P. Paradell, J. L. Dominguez-Garcia, and A. Colet</i>	297
On the Imputation of Power System Measurement Streams with Imperfect Wireless Communication <i>T. A. Alexopoulos, C. Kalatas, and G. N. Korres</i>	302
Machine Learning Models for Predicting the Quality Factor of FSO Systems with Multiple Transceivers <i>A. A. Algedir and T. Y. Elganimi</i>	308

Energy Data Visualizations on Smartphones for Triggering Behavioral Change: Novel Vs. Conventional	312
<i>A. Al-Kababji, A. Alsalemi, Y. Himeur, F. Bensaali, A. Amira, R. Fernandez, and N. Fetais</i>	
Performance Enhancement of Crescent Patch Antenna with Rectangular Slots and Inset Fed for 5G Applications	318
<i>K. Cuneray, N. Akcam, and T. Okan</i>	
DDoS Attack Detection and Mitigation at SDN Data Plane Layer	322
<i>H. S. Abdulkarem and A. Dawod</i>	
High Resolution L-band Stepped Frequency Continous Wave Radar for Smuggling Contrast	327
<i>M. Donelli, M. Manekiya, G. Marchi, I. Maccani, and C. Pascucci</i>	
Adaptive Optics Effects on Average Channel Capacity of Oceanic Optical Wireless Communication Systems in Strong Turbulence	333
<i>M. C. Gokce</i>	
Neuro-Fuzzy Based Handover Authentication Protocol for Ultra Dense 5G Networks	339
<i>V. O. Nyangaresi, A. J. Rodrigues, and S. O. Abeka</i>	
Throughput Analysis over 5G NR Physical Uplink Shared Channels	345
<i>Y. Kabalci and M. Ali</i>	
Performance Assessment of Hybrid Precoders in the Presence of Artificial Noise	350
<i>Y. Kabalci and M. Ali</i>	
Energy Efficient Power Allocation in Massive MIMO NOMA Systems Based on SIF Using Cell Division Technique	356
<i>A. S. Gharagezlou, J. Pourrostam, M. Nangir, and M. M. Safari</i>	
Secured Hybrid Precoder Design Based on Generalized Triangular Decomposition Method	362
<i>Y. Kabalci and M. Ali</i>	
Performance Analysis of Polar Coding Scheme for Narrowband Internet of Things	368
<i>R. S. Zakariyya, K. H. Jewel, A. O. Fadamiro, F. Lin, A. M. Jajere, and U. J. Mohammed</i>	