

2025 6th International Conference on Power Electronics and their Applications (ICPEA 2025)

**Ghardaia, Algeria
18-20 November 2025**

IEEE Catalog Number:
ISBN:

CFP25U14-POD
979-8-3315-7166-5



Copyright © 2025, IEEE

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:	CFP25U14-POD
ISBN (Print-On-Demand):	979-8-3315-7166-5
ISBN (Online):	979-8-3315-7165-8

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

Advancing PV Array Reconfiguration with Hybrid Multi-Objective Improved Wild Horse Optimization	1
<i>C. Janani, B. Chitti Babu, Vijayakumar. K, Feridinand T, Dasari Venkayya</i>	
Golden Jackal Optimizer-Based PI Controller for Efficient MPPT in Photovoltaic Systems	7
<i>Said Benkaihoul, Derradji Bakria, Amar Regaz, Yıldırım Özüpak, Abdesselam Belkheir</i>	
<i>Ahmed Memdouh Younsi</i>	
Parameters Identification of a Photovoltaic Module Operating in Desert Conditions: Application to the Adrar Region	13
<i>Laribi Slimane, Ghaitaoui Touhami, Khaled Koussa, Arama Fatima Zohra</i>	
Assessing the Technical Viability of a Stand-Alone Solar-Powered Evs Charging Station in a Very Hot Location: the Case Study of GhardaïA, Algeria	18
<i>Fadila Barkat, Josep M. Guerrero, Djemoui Lalmi, Ioan Viorel Banu</i>	
Performance Evaluation of GEO and GWO for Optimal Photovoltaic DG Placement in a 33-Bus Distribution Network	22
<i>Hala Lalaymia, Abdelhak Djellad, Meriem Farou, Badri Rekik</i>	
A Novel Nanobiosensor Based on Carbon Nanotube Tunnel Field-Effect Transistor for Low-Power and Label-Free Detection: Design and Quantum Simulation Analysis	27
<i>Khalil Tamersit, Hocine Bourouba, Abdellah Kouzou</i>	
Computational Study of Sub-5-nm WS ₂ Nanosheet FETs with Vacuum Dielectric for Radiation-Hardened Nanoelectronics	31
<i>Khalil Tamersit, Abdellah Kouzou</i>	
Multi-Resolution Fractal Dimension and Wavelet Analysis of Leakage Currents for Diagnosing the Surface Condition of Polluted High-Voltage Insulators	35
<i>Imene Ferrah, Rabie Salhi, El Mouatez Billah Messini</i>	
Performance Evaluation and Comparative Analysis of NPC, H-Bridge, and Flying Capacitor of Five Level Converters	40
<i>Assala Guergouri, Farid Merahi, Abdessalam Badoud</i>	
Triangle-Based Background Removal and Statistical Feature Extraction for Robust Face Recognition	45
<i>Badreddine Alane, Djabir Mosbah, Leila Hellal</i>	
Design and Evaluation of a Double-Loop ADRC Scheme for DC–DC Push–Pull Converters	50
<i>Mohammed Benmiloud, Mohammed Belkhiri, Atallah Benalia</i>	
Adaptive Under-Voltage Load Shedding for Distribution Systems with High DG Penetration	56
<i>Leila Lalia Mizat, Mohamed Lahdeb, Youcef Oubbati, Hichem Nemouchi</i>	
Design and Control of Photovoltaic/Battery Microgrid Based on Wild Horse Optimizer	62
<i>Abdelkader Firah, Mouhoub Birane, Aicha Degla, Slimane Sayah</i>	
A Hybrid LSTM Forecasting Models with Dual Signal Decomposition: A Comparative Study for Energy Consumption	68
<i>Fatima Zohra Oulad Laid, Khaled Ferkous, Charaf Abdelkarim Mosbah, Soundous Sekayar</i>	
<i>Abderahmane Bellaour</i>	

Advanced Control Using an Interval Type 2 Fuzzy Neural Network for the Double Stator Interior Permanent Magnet Synchronous Motor Fed by a Nine Switch Inverter	74
<i>Rabie Benaissa, Smail Mansouri, Omar Ouledali</i>	
Robust DTC of DSIM with MOA-Based Third Order Sliding Mode Control	80
<i>Belkaid Rahma, Elmoataz Tebbakh, Miloud Mansri</i>	
Design of a Buck—Boost Converter with Parasitic Elements Using a Sliding Mode Controller	87
<i>Mathew John Kamara, Mustafa Aktaş, Barış Çavuş</i>	
Robust Framework for Secure Partial Shading Detection in Photovoltaic Systems Under Adversarial Attacks	92
<i>Ali Teta, Abdellah Kouzou, Okba Fergani, El Ouanas Belabbaci, Mohamed Elbar</i>	
Study and Control of Totem-Pole PFC Converter Based on a PI-MPC Control Strategy	98
<i>Abdesselam Belkheir, Said Benkaihou, Benaissa Amar, Dahmane Djendaoui, Bouchhida Ouahid Benkhoris Mohamed Fouad</i>	
Field Oriented Control of Permanent Magnet Synchronous Motor with Synergetic Control	104
<i>Idris Azizi, Ismail Haddi, Brahim Dahraoui, Farid Belouahchi</i>	
Optimization of Selective Harmonic Elimination for Emerging Single-Phase Five-Level Inverter Using Genetic Algorithm	110
<i>Alla Eddine TOUBAL MAAMAR, Mourad NAIDJI, Touhami ABDELOUAHED, Aimad BOUDOUDA Radu PORUMB, Saad MEKHILEF</i>	
Intelligent Power Flow Management for a Photovoltaic El Abiodh Sidi Cheikh Grid: A PSO-Based Approach	116
<i>Ali Abderrazak Tadjeddine, Hichem Hamiani, Ridha Ilyas Bendjillali, Sofiane Mohammed Bendelhoum Mourad Kholkhal, Salih Lachache</i>	
A 300 kW GaN-Based Vector-Controlled Synchronous Motor Drive for EV Traction	122
<i>Kayyam Saikumar, Prem Kumar, Thamizhselvan T</i>	
Adaptive Interval Type-2 Fuzzy-PI Control for Improved Dynamic Power Regulation in DFIG-Based Wind Energy Systems	129
<i>Rafik Dembri, Mourad Kezai, Lazhar Rahmani</i>	
Multi-Objective Optimal Design of an Off-Grid Hybrid Renewable Energy System Ensuring Reliability and Minimizing Life Cycle Costs	137
<i>Yehya Houam, Abdelkader Si Tayeb, Abdelhamid Djari, Abdelkrim Khelifa, Khaled Touafek</i>	
Performance Optimization of a Cylindrical DBD Ozone Generator Using RMS and Metaheuristic Algorithms	143
<i>E. Khelifi, M.N. Brahami, I.S. Bousmaha, F.Z. Boudjella, M. Brahami, R.D. Mohammedi, S.E. Bechekir M. Jbilou</i>	
PSO and ACO-Optimized Cascade PI Control of DC-DC Buck-Boost Converter for High-Performance DC Machine Speed Regulation in Mecha-Electrical Wind Pumping Systems	149
<i>Abdelkader Elmeddah, Djalloul Achour</i>	
A Simulation Framework for Assessing Power Losses in Photovoltaic Modules Induced by Cell Cracking	155
<i>Farid Hadjrioua, Beddar Antar, Djelloul Djafer, Idriss hadj mahammed, Samir Hamid Oudjana</i>	

Enhanced Energy Management in Grid-Connected PV Systems Using a Fractional-Order Calculus	159
<i>Antar Beddar, Issam Abadlia, Farid Hadjrioua, Hadj M. Idriss, Bendjouad Messoud, Djafer Djelloul</i>	
Synergetic Control of Multiphase Induction Wind Generator Associated with Flywheel Energy Storage System Controlled by Smooth Sliding Mode	164
<i>Djamel Derkouché, Katia Kouzi, Abdelraouf Beddi, M'hamed Birame, Mohamed Hamidat Belkheir Abdesselam</i>	
Deep Learning-Based Dynamic Harmonic Compensation in Three-Phase Systems Using DNN-Controlled Shunt Active Power Filter	170
<i>Mohamed Elbar, Derradji Bakria, Belkacem Korich, Abdelkader Beladel, Ali Teta, Abdelkader Laouid</i>	
Evaluation and Comparison of MPPT Methods in Shaded PV Systems Using HHO and GA	176
<i>Y. Izgheche, T. Bahi, A. Lakhdara</i>	
Enhancing the Stability of STATCOM Topology Under Three-Phase Short Circuit Fault Using Fuzzy Logic Controller	182
<i>Ahmed Mokhtari, Ameer Fethi Aimer, Cherif Mokhtar, Mohamed Amara</i>	
Advanced MSOGI Virtual Impedance Control for Power-Sharing Improvement in Standalone Microgrids	188
<i>Camelia Ait Hammouda, Rafik Bradai, Rachid Boukenoui, Abdelhamid Kherbach, Ahmed Bendib</i>	
Experimental Evaluation of Temperature Estimation Methods for a Photovoltaic Module	194
<i>Zine Eddine Touhami Ternifi, Mohammed El Bachir Ghribi, Luis Garcia-Gutierrez, Salah Eddine Mankour Michel Aillerie, Ghalem Bachir</i>	
Dual Star Induction Motor EV Drive Using Nine-Switch Quasi-Z-Source Inverter	198
<i>Ismail Benmiloud, Aissa Amuer, Najib Essounbouli, Moulay Kheireddine, Katia Kouzi, Hamidat Mohammed</i>	
Experimental Implementation of FS-Predictive Current Control with MPPT-OTC for Performance Optimization of PMSG-Based Wind Energy Systems	204
<i>Hicham Sayhi, Amor Bourek, Abdelkarim Ammar, Ali Teta, Derradji Bakria, Ahmed Chennana</i>	
High-Performance Photovoltaic-Fed DOEWIM Drive: A Backstepping and Reduced-Order Observer Approach with Matrix Converter Integration	210
<i>Sellah Mourad, Dourari Ahmed Lamine, Kouzou Abdellah, Naas Bachir, Souissi Amar, Boukhalfa Mohamed</i>	
Experimental Realization of the Second and Third Stages of a Solid-State Transformer	218
<i>Nassim Zemirline, Nadir Kabeche, Samir Moulahoum, Sofiane Khechafi</i>	
Experimental Comparison of Sunflower Oil and Brick Pieces as Heat Storage Materials for Solar Cooking Applications	224
<i>Assam Benbaha, Fatiha Yettou, Amor Gama, Azoui Boubekeur</i>	
Resilient Power Management for Unmanned Small-Scale Hybrid Diesel–Electric Shipboard Microgrids	230
<i>Youcef Belkhier, Florent Becker, Adel Oubelaid, Jean-Frédéric Charpentier, Abdeslam Mamoune Mohamed Benbouzid</i>	
A Comparative Study Between Fractional Order PI, and Classic PI Control for Power Quality Improvement in Microgrid Connected System	236
<i>Khaoula Nermine Khallouf, Laid Zarour, Samah Bouaroudj</i>	
Software-in-the-Loop Validation of a PEC9-Based Multifunction Solar Active Filter	244
<i>Soufian Khettab, Amel Kasri, Youcef Belkhier, Aissa Kheldoun, Mohamed Benbouzid</i>	

Real-Time SIL Validation of Dual-Stage Robust Predictive Control for Multiphase Wind Generators	250
<i>Amel Kasri, Soufian Khettab, Youcef Belkhier, Kamel Ouari, Yassine Amirat, Mohamed Benbouzid</i>	
Experimental Performance Analysis of Air- and Water-Cooled Thermoelectric Generator Systems Under Low-Temperature Renewable Heat Conditions	256
<i>Marcellin Jay C. Panes, Renyl B. Barroca</i>	
Village-Scale Off-Grid Solar Microgrids: Advancing Rural Electrification Through Distributed Generation and Storage	262
<i>Marcellin Jay C. Panes</i>	
Experimental Evaluation of Predictive Torque Control for B6 and B4 Inverter-Fed Induction Motors	268
<i>Aissa Kheldoun, Soufian Khettab, Oussama Merabet, Hamza Belmadani</i>	
Cost Emission Optimization in Hybrid Power System Incorporating Solar Irradiance Variations	274
<i>Abid Mokhtar, Mekhalfia Ramadhan, Abid Wail</i>	
Hybrid ANN PV Power Forecasting with Multi-Decomposition: Tindouf Case Study	280
<i>Soundous Sekayar, Khaled Ferkous, Mawloud Guermoui, Fatima Zohra Oulad Laid, Abderahmane Bellaour</i>	
Cfd-Driven Optimization of Channel Cross-Section Geometry in Planar and Tubular PEMFCs: Enhancing Power Density and Reducing Pressure Drop	286
<i>Guerbazi Mohamed El Amine, Mohammedi Abdallah, Djeflal Selman, Sahli Youcef, Chine Adel</i>	
Theoretical Insights and Numerical Simulation of CdS/CuInS ₂ Heterojunction Solar Cells for Enhanced Performance Analysis	290
<i>Z. Younsi, H. Bencherif, F. Meddour</i>	
Integrating Virtual Reality in Electrical Machine Learning: An Experiential Approach to Motor Component Understanding	295
<i>Mouhcen El-hadi Dahmoun, Salima Khaoula Reguieg, Abdessamed Yousfi</i>	
Physically Grounded Electro-Thermal and Structural Modeling of a High-Efficiency Monocrystalline PV Cell for Embedded Energy Systems	300
<i>Sarah K. Sedjar, Mourad Benmessaoud</i>	
Performance Analysis of Long-Distance HVDC Transmission for Solar Power Transport in Algeria: Case Study of GhardaïA – Tamanrasset Line	305
<i>Abdelghani Guechi, Nedjem-Eddine Benchouia, Mohammed Saaidia</i>	
Seamless Transition Between Grid-Following and Grid-Forming Modes for Grid-Tied Virtual Synchronous Generator with LCL Filter	311
<i>Ahmed Lakhdar Kouzou, Ali Sharida, Sertac Bayhan, Haitham Abu-Rub</i>	
Evaluation of a PV-Battery-Grid System: Case Study in the Ghardaia Region	317
<i>Nouredine Benbaha, Abdelhak Bouchakour, Omar Maiz Hadj Ahmed, Hachemi Ammar Seif eddine Boukebbous</i>	
Optoelectronic Tuning of Sputtered ZnO–Au–Ag (NPs) Films Through Gold Interlayer Design	323
<i>K. Kacha, F. Djeflal, R. Nezzar, A. Bendjrad, A. Benhaya</i>	