SPECIAL SECTION ON ACTIVE AND HYBRID FILTERS TO ENHANCE ELECTRIC POWER QUALITY

Guest Editorial ............................................... K. Al-Haddad 2799

SPECIAL SECTION PAPERS

An Investigation on Design and Switching Dynamics of a Voltage Source Inverter to Compensate Unbalanced and Nonlinear Loads .................................................. M. K. Mishra and K. Karthikeyan 2802

An Implementation of an Adaptive Control Algorithm for a Three-Phase Shunt Active Filter ........................................... B. Singh and J. Solanki 2811

DSP-Based Implementation of an LQR With Integral Action for a Three-Phase Three-Wire Shunt Active Power Filter

.............................................................. B. Kedjar and K. Al-Haddad 2821

A Signal-Processing Adaptive Algorithm for Selective Current Harmonic Cancellation in Active Power Filters

............................................................ F. D. Freijedo, J. Doval-Gandoy, Ó. López, P. Fernández-Comesaña, and C. Martínez-Peña 2829

The Application of Particle Swarm Optimization to Passive and Hybrid Active Power Filter Design

...................................................... N. He, D. Xu, and L. Huang 2841

The Use of Genetic Algorithms for the Design of Resonant Compensators for Active Filters

...................................................... W. Lenwari, M. Sumner, and P. Zanchetta 2852

Selective Compensation in Four-Wire Electric Systems Based on a New Equivalent Conductance Approach

...................................................... S. Orts-Grau, F. J. Gimeno-Sales, S. Seguí-Chilet, A. Abellán-García, M. Alcañiz-Fillol, and R. Masot-Peris 2862

Real-Time Estimation of Fundamental Frequency and Harmonics for Active Shunt Power Filters in Aircraft Electrical Systems

....................................................... E. Lavopa, P. Zanchetta, M. Sumner, and F. Cupertino 2875

Hybrid Power Filter to Enhance Power Quality in a Medium-Voltage Distribution Network

......................................................... V. F. Corasaniti, M. B. Barbieri, P. L. Arnera, and M. I. Valla 2885

An Optimized Space Vector Modulation Sequence for Improved Harmonic Performance

......................................................... A. Mehrizi-Sani and S. Filizadeh 2894

A New Control Technique for Three-Phase Shunt Hybrid Power Filter

......................................................... S. Rahmani, A. Hamadi, N. Mendalek, and K. Al-Haddad 2904

(Contents Continued on Page 2797)
SPECIAL SECTION ON THE 2008 IEEE INTERNATIONAL CONFERENCE ON INDUSTRIAL TECHNOLOGY (ICIT 2008)

Guest Editorial .......................................................... K. Ohishi and K. F. Man 2916

SPECIAL SECTION PAPERS
FPGA Realization of an Adaptive Fuzzy Controller for PMLSM Drive ........................................ Y.-S. Kung, C.-C. Huang, and M.-H. Tsai 2923
Finite-Mode Networks for Motion Control ................................................................. B. Yalcin and K. Ohnishi 2933
Robust Control of PM Spherical Stepper Motor Based on Neural Networks ................................. Z. Li 2945
A Novel High-Frequency Transformer-Linked Soft-Switching Half-Bridge DC–DC Converter With Constant-Frequency Asymmetrical PWM Scheme ............................. T. Mishima and M. Nakaoka 2961
Two Types of KY Buck–Boost Converters .................................................................. K. I. Hwu and Y. T. Yau 2970
Enhanced Particles With Pseudolikelihoods for Three-Dimensional Tracking ....................... H. Chen and Y. Li 2992

PAPERS

Multiphase Systems
Dual-Modulator Compensation Technique for Parallel Inverters Using Space-Vector Modulation ........ T.-P. Chen 3004
Harmonic-Spectrum Spreading Effects of Two-Phase Random Centered Distribution PWM (DZRC) Scheme With Dual Zero Vectors ......................................................... S.-Y. Oh, Y.-G. Jung, S.-H. Yang, and Y.-C. Lim 3013

Machines and Drives
Sensorless Control of Induction Motor Drives at Very Low and Zero Speeds Using Neural Network Flux Observers ................................................................. S. M. Gadoue, D. Giouaris, and J. W. Finch 3029
An FPGA-Based Novel Digital PWM Control Scheme for BLDC Motor Drives ........................ A. Sathyana, N. Milivojevic, Y.-J. Lee, M. Krishnamurthy, and A. Emadi 3040
Adaptive Speed Control for Permanent-Magnet Synchronous Motor System With Variations of Load Inertia ................................................................. S. Li and Z. Liu 3050

Single-Phase Electronics
A Loosely Coupled Planar Wireless Power System for Multiple Receivers ................................. J. J. Casanova, Z. N. Low, and J. Lin 3060
Energy Saving of Large-Scale High-Intensity-Discharge Lamp Lighting Networks Using a Central Reactive Power Control System ....................................................... W. Yan, S. Y. R. Hui, and H. S.-H. Chung 3069
Hybrid Electric Vehicle Power Management Solutions Based on Isolated and Nonisolated Configurations of Multilevel Modular Capacitor-Clamped Converter .......................... F. H. Khan, L. M. Tolbert, and W. E. Webb 3079
A Nonisolated ZVS Asymmetrical Buck Voltage Regulator Module With Direct Energy Transfer ................ Z. Zhang, W. Eberle, Y.-F. Liu, and P. C. Sen 3096
Selective Harmonic-Compensation Control for Single-Phase Active Power Filter With High Harmonic Rejection ................................................................. J. Miret, M. Castilla, J. Matas, J. M. Guerrero, and J. C. Vasquez 3117
Current Harmonic Compensation by a Single-Phase Shunt Active Power Filter Controlled by Adaptive Neural Filtering ................................................................. M. Cirrincione, M. Pucci, G. Vitale, and A. Miraoui 3128

(Contents Continued on Page 2798)
### Transformerless DC–DC Converters With High Step-Up Voltage Gain
L.-S. Yang, T.-J. Liang, and J.-F. Chen 3144

### Dual-Buck Full-Bridge Inverter With Hysteresis Current Control
Z. Yao, L. Xiao, and Y. Yan 3153

#### Renewable Energy Systems

### Fuzzy-Logic-Based V/f Control of an Induction Motor for a DC Grid Power-Leveling System Using Flywheel Energy Storage Equipment
X.-D. Sun, K.-H. Koh, B.-G. Yu, and M. Matsui 3161

### A New Control Strategy of Single-Stage Flyback Inverter
F. Zhang and C. Gong 3169

#### Robotics and Mechatronics

### ANN-Based Adaptive Control of Robotic Manipulators With Friction and Joint Elasticity
H. Chaoui, P. Sicard, and W. Gueaieb 3174

#### Actuators and Motors

### Bifurcation Analysis of Ultrashort Self-Acting Gas Journal Bearings for MEMS

#### Control and Signal Processing

### Strobe Imaging System for Digital Image-Based Elasto-Tomography Breast Cancer Screening

### Transforming Traditional Iris Recognition Systems to Work in Nonideal Situations
Z. Zhou, Y. Du, and C. Belcher 3203

### Online Parameter Tuning Technique for Predictive Current-Mode Control Operating in Boundary Conduction Mode
Y.-T. Chang and Y.-S. Lai 3214

### Improved Digital Peak Voltage Predictive Control for Switching DC–DC Converters
J. Xu, G. Zhou, and M. He 3222

#### Diagnosis and Monitoring

### A Simple Offline Technique for Evaluating the Condition of Aluminum–Electrolytic–Capacitors
A. M. R. Amaral and A. J. M. Cardoso 3230

#### Instrumentation and Sensors

### Thermal Characterization of Si₃N₄ Thin Films Using Transient Thermoreflectance Technique
S. Bai, Z. Tang, Z. Huang, and J. Yu 3238

#### Intelligent Systems

### A Grey System Modeling Approach for Sliding-Mode Control of Antilock Braking System
E. Kayacan, Y. Oniz, and O. Kaynak 3244

### Reconfigurable Hardware Architecture of a Shape Recognition System Based on Specialized Tiny Neural Networks With Online Training
F. Moreno, J. Alarcón, R. Salvador, and T. Riesgo 3253

#### LETTERS

### Energy-Recovery Circuit Using an Address Voltage Source for PDPs
K.-H. Yi and G.-W. Moon 3264