### PAPERS

#### Multiphase Systems

A Modified Three-Phase Four-Wire UPQC Topology With Reduced DC-Link Voltage Rating
- S. B. Karanki, N. Geddda, M. K. Mishra, and B. K. Kumar
- Page 3555

Enhanced-Boost Z-Source Inverters With Alternate-Cascaded Switched- and Tapped-Inductor Cells
- D. Li, P. C. Loh, M. Zhu, F. Gao, and F. Blaabjerg
- Page 3567

Effect of Voltage Transformation Ratio on the Kilovoltampere Rating of Delta-Connected Autotransformer for 12-Pulse Rectifier System
- F. Meng, W. Yang, and S. Yang
- Page 3579

Analysis of High-Efficiency Three-Phase Two- and Three-Level Unidirectional Hybrid Rectifiers
- T. B. Soeiro and J. W. Kolar
- Page 3589

Next-Generation Multi-Functional Modular Intelligent UPS System for Smart Grid
- B. Zhao, Q. Song, W. Liu, and Y. Xiao
- Page 3602

#### Machines and Drives

Capacitor Voltage Regulation in Single-DC-Source Cascaded H-Bridge Multilevel Converters Using Phase-Shift Modulation
- H. Sepahvand, J. Liao, M. Ferdowsi, and K. A. Corzine
- Page 3619

A Nine-Level Inverter Topology for Medium-Voltage Induction Motor Drive With Open-End Stator Winding
- Page 3627

Design and Operation Characteristics of Four-Two Pole High-Speed SRM for Torque Ripple Reduction
- D.-H. Lee, T. H. Pham, and J.-W. Ahn
- Page 3637

Design and Implementation of an Online Tuning Adaptive Controller for Synchronous Reluctance Motor Drives
- M.-Y. Wei and T.-H. Liu
- Page 3644

An Effective Energy-Saving Scalar Control for Industrial IPMSM Drives
- A. Consoli, G. Scelba, G. Scarcella, and M. Cacciato
- Page 3658

On the Causes of Circulating Currents in PWM Drives With Open-End Winding AC Machines
- A. Somani, R. K. Gupta, K. K. Mohapatra, and N. Mohan
- Page 3670

Application of the MPC to the Position Control of the Two-Mass Drive System
- P. J. Serkies and K. Szabat
- Page 3679

#### Single-Phase Electronics

Automated Impedance Matching System for Robust Wireless Power Transfer via Magnetic Resonance Coupling
- T. C. Beh, M. Kato, T. Imura, S. Oh, and Y. Hori
- Page 3689

Start-up Procedure and Switching Loss Reduction for a Single-Phase Flying Capacitor Active Rectifier
- H. Sepahvand, M. Khazaeei, K. A. Corzine, and M. Ferdowsi
- Page 3699

The Implementation of Bee Colony Optimization Algorithm to Sheppard–Taylor PFC Converter
- A. Karaarslan
- Page 3711

(Contents Continued on Page 3553)
Solid-State Transformer Architecture Using AC–AC Dual-Active-Bridge Converter.......................... H. Qin and J. W. Kimball
A New Single-Phase Single-Stage Three-Level Power-Factor-Correction AC–DC Converter With Phase-Shift Modulation.............................................. M. Narimani and G. Moschopoulos
Current-Fed High-Frequency AC Distributed Power System for Medium-High-Voltage Gate Driving Applications............................................................ H. Wen, W. Xiao, and Z. Lu
Small-Signal Modeling of Digitally Controlled Grid-Connected Inverters With LCL Filters............................................................ X. Zhang, J. W. Spencer, and J. M. Guerrero

Renewable Energy Systems
Novel High-Efficiency Three-Level Stacked-Neutral-Point-Clamped Grid-Tied Inverter................................. Y. Wang and R. Li
A Novel Scheme Suitable for High-Voltage and Large-Capacity Photovoltaic Power Stations.................................................... C. Zhang, S. Du, and Q. Chen

Robotics and Mechatronics
Fractional-Order PI^D^2 and Active Disturbance Rejection Control of Nonlinear Two-Mass Drive System................... K. Erenturk
Decoupled Dynamic Control for Pitch and Roll Axes of the Unicycle Robot.................................................. J. Lee, S. Han, and J. Lee

Control and Signal Processing
A Distributed TDMA Scheduling Algorithm for Target Tracking in Ultrasonic Sensor Networks............................................................. P. Cheng, F. Zhang, J. Chen, Y. Sun, and X. (Sherman) Shen
Binary Coding SVMs for the Multiclass Problem of Blast Furnace System...................................................... L. Jian and C. Gao
Robust Zero Placement for Motion Control of Lightly Damped Systems......................................................... C.-W. Ha, K.-H. Rew, and K.-S. Kim
Initial Friction Compensation Using Rheology-Based Rolling Friction Model in Fast and Precise Positioning.............................. Y. Maeda and M. Iwasaki
High Dynamic Torque Control for Industrial Engine Test Beds.......................................................... C. Westermayer, R. Priesner, M. Kozeck, and R. Bauer
Saturated Adaptive Robust Control for Active Suspension Systems.................................................. W. Sun, Z. Zhao, and H. Gao
On Low-Velocity Compensation of Brushless DC Servo in the Absence of Friction Model.......................... M. Sun, Z. Wang, Y. Wang, and Z. Chen
Frequency-Domain Analysis of Nonlinear Active Disturbance Rejection Control via the Describing Function Method.............................. D. Wu and K. Chen
Feed-Forward Scheme Considering Bandwidth Limitation of Operational Amplifiers for Envelope Tracking Power Supply Using Series-Connected Composite Configuration................................. H. Xi, Q. Jin, and X. Ruan
Identification and Compensation of Piezoelectric Hysteresis Without Modeling Hysteresis Inverse......................................................... Q. Xu
A Digitally Controlled Switching Regulator With Reduced Conductive EMI Spectra................................................................. C.-H. Tsai, C.-H. Yang, and J.-C. Wu
Multicomponent Signal Analysis Based on Polynomial Chirplet Transform................................................ Y. Yang, W. Zhang, Z. Peng, and G. Meng

Diagnosis and Monitoring
Open-Circuit Fault Diagnosis in PMSG Drives for Wind Turbine Applications.................................................. N. M. A. Freire, J. O. Estima, and A. J. Marques Cardoso
Detection of Mass Increase in a Fan Impeller With a Frequency Converter............................................................. J. Tamminen, T. Ahonen, J. Ahola, M. Niemelä, A. Tahvanainen, and A. Potinkara

Instrumentation and Sensors
Pretest Gap Mura on TFT LCDs Using the Optical Interference Pattern Sensing Method and Neural Network Classification........................................ T.-Y. Li, J.-Z. Tsai, R.-S. Chang, L.-W. Ho, and C.-F. Yang

Embedded Systems
Directional People Counter Based on Head Tracking................................................................................. J. García, A. Gardel, I. Bravo, J. L. Lázaro, M. Martínez, and D. Rodríguez

(Contents Continued from Front Cover)
Networking
Frame Packing for Minimizing the Bandwidth Consumption of the FlexRay Static Segment

M. Kang, K. Park, and M.-K. Jeong 4001

SPECIAL SECTION ON ADVANCES IN DIAGNOSIS FOR ELECTRICAL MACHINES, POWER ELECTRONICS, AND DRIVES—PART II
Introduction to the Special Section on Advances in Diagnosis for Electrical Machines, Power Electronics, and Drives—Part II

G.-A. Capolino and F. Filippetti 4009

SPECIAL SECTION PAPERS

Advanced Diagnosis of Electrical Faults in Wound-Rotor Induction Machines
Y. Gritli, L. Zarri, C. Rossi, F. Filippetti, G.-A. Capolino, and D. Casadei

Stator-Current Spectrum Signature of Healthy Cage Rotor Induction Machines
G. M. Joksimović, J. Riger, T. M. Wolbank, N. Perić, and M. Vašak

Statistical and Neural-Network Approaches for the Classification of Induction Machine Faults Using the Ambiguity Plane Representation
T. Boukra, A. Lebaroud, and G. Clerc

Wound-Rotor Induction Generator Inter-Turn Short-Circuits Diagnosis Using a New Digital Neural Network
S. Toma, L. Capocchi, and G.A. Capolino

Detection and Diagnosis of Faults in Induction Motor Using an Improved Artificial Ant Clustering Technique
A. Soualhi, G. Clerc, and H. Razik

Rotor Faults Diagnosis Using Feature Selection and Nearest Neighbors Rule: Application to a Turbogenerator
M. Biet

Validation of a Faulted Rotor Induction Machine Model With an Insightful Geometrical Interpretation of Physical Quantities
C. Concari, G. Franceschini, C. Tassoni, and A. Toscani

Offline and Online Methods for Stator Core Fault Detection in Large Generators
R. Romary, C. Demian, P. Schlupp, and J.-Y. Roger

New Expressions of Symmetrical Components of the Induction Motor Under Stator Faults
M. B. K. Bouzid and G. Champenois

High-Resolution Parameter Estimation Method to Identify Broken Rotor Bar Faults in Induction Motors

Fault Diagnosis of DC-Link Capacitors in Three-Phase AC/DC PWM Converters by Online Estimation of Equivalent Series Resistance
X.-S. Pu, T. H. Nguyen, D.-C. Lee, K.-B. Lee, and J.-M. Kim

Real-Time Monitoring for a Five-Level Double-Boost Power Factor Controller Including Postfault Reconfiguration
T. T. L. Pham, F. Richardeau, and G. Gateau

Open- and Short-Circuit Switch Fault Diagnosis for Nonisolated DC-DC Converters Using Field Programmable Gate Array
M. Shahbazi, E. Jamshidpour, P. Poure, S. Saadate, and M. R. Zolghadri

Electrical Aging of the Insulation of Low-Voltage Machines: Model Definition and Test With the Design of Experiments
N. Lahoud, J. Faucher, D. Malec, and P. Maussion