

IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT

A PUBLICATION OF THE IEEE INSTRUMENTATION AND MEASUREMENT SOCIETY

MARCH 2011

VOLUME 60

NUMBER 3

IEIMAO

(ISSN 0018-9456)

Invited Review Paper

- Exploiting Nonlinear Dynamics in Novel Measurement Strategies and Devices: From Theory to Experiments and Applications (*Invited Paper*) S. Baglio, A. R. Bulsara, B. Andò, S. La Malfa, V. Marletta, C. Trigona, P. Longhini, A. Kho, V. In, J. D. Neff, G. W. Anderson, C. C. Obra, B. K. Meadows, and A. Palacios 667

REGULAR PAPERS

Algorithms, Artificial Intelligence, and SOFT Computing and Informatics

- An Efficient Method to Process the Quantized Acoustoelectric Current: Wavelet Transform H. Yuan, J. Gao, H. Z. Guo, and C. Lu 696
- Prognosis of Defect Propagation Based on Recurrent Neural Networks A. Malhi, R. Yan, and R. X. Gao 703
- Detection of Ships in Marine Environments by Square Integration Mode and Multilayer Perceptrons R. Vicen-Bueno, R. Carrasco-Álvarez, M. P. Jarabo-Amores, J. C. Nieto-Borge, and E. Alexandre-Cortizo 712
- Development of Laguerre Neural-Network-Based Intelligent Sensors for Wireless Sensor Networks J. C. Patra, P. K. Meher, and G. Chakraborty 725

Acoustics and Ultrasonics Instrumentation and Measurements

- An Innovative Ultrasonic Time-of-Flight Measurement Method Using Peak Time Sequences of Different Frequencies: Part I S.-B. Jiang, C.-M. Yang, R.-S. Huang, C.-Y. Fang, and T.-L. Yeh 735
- An Innovative Ultrasonic Time-of-Flight Measurement Method Using Peak Time Sequences of Different Frequencies—Part II: Implementation C.-M. Yang, S.-B. Jiang, D.-Y. Lin, F.-M. Lu, Y.-M. Wu, and T.-L. Yeh 745

A/D and D/A Conversion, Analog, and Digital Instrumentation

- Digital Compensation Techniques for Frequency-Translating Hybrid Analog-to-Digital Converters S. J. Mazlouman, S. Sheikhaei, and S. Mirabbasi 758
- Fast Digital Post-Processing Technique for Integral Nonlinearity Correction of Analog-to-Digital Converters: Validation on a 12-Bit Folding-and-Interpolating Analog-to-Digital Converter V. Kerzérho, V. Fresnaud, D. Dallet, S. Bernard, and L. Bossuet 768
- Leading-Subcycles Capacitor Error-Averaging Scheme for Cyclic ADCs C.-H. Kuo, T.-H. Fan, and T.-H. Kuo 776

Analog and Digital Data, Image, and Signal Processing

- DFT Interpolation Algorithm for Kaiser-Bessel and Dolph-Chebyshev Windows K. Duda 784
- A Virtual Instrument for Time-Frequency Analysis of Signals With Highly Nonstationary Instantaneous Frequency I. Orović, M. Orlandić, S. Stanković, and Z. Uskoković 791

(Contents Continued on Page 665)

请阅后放回:

排架号 E151 处



Dynamic Harmonic Analysis Through Taylor-Fourier Transform	<i>M. A. Platas-Garza and J. A. de la O Serna</i>	804
Instrumentation for and Measurement in Communications		
An Eigenvalue Decomposition-Based Method for In-Service Testing of Wireless Communications Systems	<i>L. Angrisani, R. S. Lo Moriello, M. D'Apuzzo, and A. Napolitano</i>	814
Frequency-Domain Methodology for Measuring MIMO Channels Using a Generic Test Bed	<i>J. Gutiérrez, Ó. González, J. Pérez, D. Ramírez, L. Vielva, J. Ibáñez, and I. Santamaría</i>	827
Instrumentation for and Measurement of Electric Power Systems, Energy Metering, and Electric Power Quality		
New Testing Method of the Shielding Effect of Heavy Current Transformer With Shielding Coils	<i>K. Qu, W. Zhao, B. Jiang, S. Huang, and P. Yang</i>	839
Bandpass Second-Degree Digital-Integrator-Based Power System Frequency Estimation Under Nonsinusoidal Conditions	<i>A. Sarkar and S. Sengupta</i>	846
Uncertainty Analysis, Accuracy, Precision, and Parameter Estimation		
Evaluation of Flexible Rogowski Coil Performances in Power Frequency Applications	<i>M. Chiampi, G. Crotti, and A. Morando</i>	854
Selecting a Reference High Resolution for Fingerprint Recognition Using Minutiae and Pores	<i>D. Zhang, F. Liu, Q. Zhao, G. Lu, and N. Luo</i>	863
Built-in Self-Test, Design-for-Testing, Fault Diagnosis, and Fault-Tolerance		
Signal Integrity Improvements of a MEMS Probe Card Using Back-Drilling and Equalizing Techniques	<i>D.-Y. Kim, J. Byun, S.-H. Lee, S.-J. Oh, K.-S. Kang, and H.-Y. Lee</i>	872
Rough-Sets-Based Reduction for Analog Systems Diagnostics	<i>P. Bilski and J. M. Wojciechowski</i>	880
Unambiguous Detection of Broken Bars in Asynchronous Motors by Means of a Flux Measurement-Based Procedure	<i>M. F. Cabanas, F. Pedrayes, M. G. Melero, C. H. Rojas García, J. M. Cano, G. A. Orcajo, and J. G. Norriella</i>	891
Imaging Techniques and Instrumentation		
Electrical Capacitance Tomography for Sensors of Square Cross Sections Using Calderon's Method	<i>Z. Cao, L. Xu, W. Fan, and H. Wang</i>	900
Signal-to-Noise and Contrast Ratio Enhancements by Quasi-Monochromatic Imaging	<i>G. Zentai</i>	908
Mechatronics, Industrial Applications, and Robotics		
A Modular Real-Time Fieldbus Architecture for Mobile Robotic Platforms	<i>U. Saranlı, A. Avci, and M. C. Öztürk</i>	916
Medical and Biomedical Instrumentation and Applications		
Wireless Sensing of Human Respiratory Parameters by Low-Power Ultrawideband Impulse Radio Radar	<i>J. C. Y. Lai, Y. Xu, E. Gunawan, E. C.-P. Chua, A. Maskooki, Y. L. Guan, K.-S. Low, C. B. Soh, and C.-L. Poh</i>	928
A New Concept of Virtual Patient for Real-Time ECG Analyzers	<i>G. Lamarque, P. Ravier, and C. Dumez-Viou</i>	939
Measurement Techniques		
Wet Gas Metering Using a Revised Venturi Meter and Soft-Computing Approximation Techniques	<i>L. Xu, W. Zhou, X. Li, and S. Tang</i>	947
Method Using Square-Pulse Excitation for High-Impedance Spectroscopy of Anticorrosion Coatings	<i>J. Hoja and G. Lentka</i>	957
Evaluation of Two Alternative Methods to Calibrate Ultrahigh Value Resistors at INRIM	<i>F. Galliana, P. P. Capra, and E. Gasparotto</i>	965
Technique and Apparatus for Accurate Cross-Sectional Stress Profiling of Optical Fibers	<i>M. R. Hutzel, R. R. Ingle, and T. K. Gaylord</i>	971
A Low-Cost Method for Measuring Surface Currents and Modeling Drifting Objects	<i>H.-C. Lee, C.-Y. Lin, C.-H. Lin, S.-W. Hsu, and C.-T. King</i>	980
Time-Varying Magnetic Field Coupled Noise Reduction in Low-Voltage Measurements in Superconductors	<i>K. Doshi, Y. Khristi, S. Kedia, and S. Pradhan</i>	990
Design and Performance of a Resistive-Divider System for Measuring Fast HV Impulse	<i>Y. Liu, F. Lin, G. Hu, and M. Zhang</i>	996
Random-Walk Technique for Measuring the Electromagnetic Environment in Electrically Large Reflective Spaces	<i>G. B. Tait and M. B. Slocum</i>	1003
Measurement of Radar Spurious Emission With High Dynamic Range and Optimized Measurement Time	<i>T. Ikäheimonen</i>	1010

Networking, Networks, and Sensor Networks

- An Efficient EM Algorithm for Energy-Based Multisource Localization in Wireless Sensor Networks *W. Meng, W. Xiao, and L. Xie* 1017
- Mine Identification and Classification by Mobile Sensor Network Using Magnetic Anomaly *S. Nazlibilek, O. Kalender, and Y. Ege* 1028
- Experimental Characterization of Synchronization Protocols for Instrument Wireless Interface *L. Ferrigno, V. Paciello, and A. Pietrosanto* 1037

Nondestructive Evaluation and Remote Sensing

- Health Monitoring of Power Cable via Joint Time-Frequency Domain Reflectometry *J. Wang, P. E. C. Stone, D. Coats, Y.-J. Shin, and R. A. Dougal* 1047

Optical Instrumentation, Measurement, and Systems

- A 400-kHz High-Accuracy Laser Telemeter for Distributed Measurements of 3-D Profiles *L. Fumagalli, P. Tomassini, M. Zanatta, and F. Docchio* 1054

RF, Microwave, Millimeter Wave, and Tera-Hertz

- Automatic Detection, Estimation, and Validation of Harmonic Components in Measured Power Spectra: All-in-One Approach *K. Barbé and W. V. Moer* 1061
- Sparse Reconstruction From GPR Data With Applications to Rebar Detection *F. Soldovieri, R. Solimene, L. Lo Monte, M. Bavusi, and A. Loperte* 1070

Sensors, Sensor Fusion, and Transducers

- Experimental Feasibility of the In-Drilling Alignment Method for Inertial Navigation in Measurement-While-Drilling *A. S. Jurkov, J. Cloutier, E. Pecht, and M. P. Mintchev* 1080
- New System for Detecting Road Ice Formation *A. Troiano, E. Pasero, and L. Mesin* 1091

Signals, Systems, and System Identification

- Local Polynomial Modeling and Variable Bandwidth Selection for Time-Varying Linear Systems *S. C. Chan and Z. G. Zhang* 1102

Me

Salva

Abstra
nonlinea
out meth
as nonlin
described
behavior
ized by t
separate
from one
target st
times" in
the mon
readout
processi
intrinsic
signal a
present
of "resid
mental
(in parti
some no
ear (in t
couplin
provide
We dis
marizin

Manu
August
supporte
Office of
National
The Ass
Dr. Reza
S. Ba
Dipartin
Studi di
bruno.a
A. R.
C. C. C
Systems
spawar
A. Pa
Mathem
7720 U
Colo
at http:
Digi