2013 IEEE International Instrumentation and Measurement Technology Conference

(I2MTC 2013)

Minneapolis, Minnesota, USA
6 – 9 May 2013

Pages 1-911

IEEE Catalog Number: CFP13IMT-PRT
ISBN: 978-1-4673-4621-4

TABLE OF CONTENTS

Welcome Message from the Chairpersons ..... **liv**

I2MTC 2013 Organizing Committee ..... **lv**

I²MTC 2013 Technical Program Committee ..... **lv**

I²MTC Board of Directors ..... **lvii**

I2MTC 2013 Keynote Speakers ..... **lviii**

I2MTC 2013 Conference Sponsors ..... **lix**

I2MTC 2013 Patrons ..... **lix**

I2MTC 2013 Exhibitors ..... **lxi**

Awards and Distinctions ..... **lxv**

2013 I&M Society Fellows ..... **lxx**

2012 I&M Society Senior Member Elevations ..... **lxx**

I²MTC Tradition ..... **lxxi**

IEEE Instrumentation and Measurement Society ..... **lxxii**

I²MTC 2014 Call for Papers ..... **lxxv**

Tuesday, May 7

09:55 - 12:20
PS1A (Poster Session): Student Poster Contest
Room: Pavilion
Chair: *Dario Petri (University of Trento, Italy)*

Estimation of In-tube Oil Film Thickness using Electrical Capacitance Tomography ***1***
Ziqiang Cui (Tianjin University, P.R. China)
Huaxiang Wang (Tianjin University, P.R. China)
Chengyi Yang (Tianjin University, P.R. China)
Yanbin Xu (Tianjin University, P.R. China)

A Low Power Multi-Frequency Current Mode Lock-in Amplifier for Impedance Sensing ..... **N/A**
Jinlong Gu (University of Tennessee, USA)
Nicole McFarlane (University of Tennessee, USA)

Diagnostic radiography: an experimental study for estimation of optimal patient dose ***11***
G. Andria (Polytechnic of Bari, Italy)
F. Attivissimo (Polytechnic of Bari, Italy)
A. Di Nisio (Polytechnic of Bari, Italy)
G. Guglielmi (University of Foggia, Italy)
A. M. L. Lanzolla (Polytechnic of Bari, Italy)
R. Terlizzi (Scientific Institute Hospital "Casa Sollievo della Sofferenza")

Reliable Measurement of Wireless Sensor Network Data for Forecasting Wellness of Elderly at Smart Home ***16***
N. K. Suryadevara (Massey University, New Zealand)
S. C. Mukhopadhyay (Massey University, New Zealand)
R. Wang (Massey University, New Zealand)
R. K. Rayudu (Victoria University of Wellington, New Zealand)
Y. M. Huang (National Cheng-Kung University, Taiwan)

An embedded inductively coupled printed circuit board based corrosion potential sensor *22*
Khalada Perveen (University of Manitoba, Canada)
Greg E. Bridges (University of Manitoba, Canada)
Sharmistha Bhadra (University of Manitoba, Canada)
Douglas J. Thomson (University of Manitoba, Canada)

PS1B (Poster Session): Student Poster Contest
Room: Pavilion
Chair: *Dario Petri (University of Trento, Italy)*

An Embeddable Microwave Patch Antenna Module for Civil Engineering Applications *27*
Robert Salama (University of Western Sydney, Australia)
Sergey Kharkovsky (University of Western Sydney, Australia)

Characterization of Multi-Standard Power Line Communication on Low-Voltage Grid *31*
Chiara Maria De Dominicis (University of Brescia, Italy)
Alessandra Flammini (University of Brescia, Italy)
Stefano Rinaldi (University of Brescia, Italy)
Mattia Rizzi (University of Brescia, Italy)
Angelo Vezzoli (University of Brescia, Italy)

Signal Measurement System Using Electrically Isolated Probe for MHz-Band Near-Field Coupling Communication *37*
Mami Nozawa (Kyoto Institute of Technology, Japan)
Tomonori Nakamura (Kyoto Institute of Technology, Japan)
Hitoshi Simasaki (Kyoto Institute of Technology, Japan)
Yuichi Kado (Kyoto Institute of Technology, Japan)
Mitsuru Shinagawa (Hosei University, Japan)

Dew point measurement using a quartz crystal sensor *41*
Jing Nie (Beihang University, P.R. China)
XiaoFeng Meng (Beihang University, P.R. China)
LiJun Xu (Beihang University, P.R. China)
Rui Zheng (Beihang University, P.R. China)

Novel Method for the In Situ Measurement of the Temperature of a Satellite's Solar Panel *45*
Jeevan Doss C. R. (Indian Institute of Technology Madras, India)
Kumaravel M (Indian Institute of Technology Madras, India)
Boby George (Indian Institute of Technology Madras, India)
Jagadeesh Kumar V (Indian Institute of Technology Madras, India)

PS1C (Poster Session): Measurement, Instrumentation and Methodologies Related to Healthcare Systems
Room: Pavilion
Chair: *Yi-Jiun Huang* (Telecommunication Laboratories, Chunghwa Telecom Co., Ltd., Taiwan)

Bond-Graph model of axial vibrations in a Drill-Hand-Arm system *49*
Darwin J. Ruiz (Universidad del Norte, Colombia)
Juan C. Galvis (Universidad del Norte, Colombia)
Roque J. Hernandez (Universidad del Norte, Colombia)
Eduardo E. Zurek (Universidad del Norte, Colombia)

A New Inductive Proximity Sensor as a Guiding Tool for Removing Metal Shrapnel during Surgery *53*
Mithun Sakthivel (Indian Institute of Technology Madras, India)
Boby George (Indian Institute of Technology Madras, India)
Jayashankar V. (Indian Institute of Technology Madras, India)
Mohanasankar Sivaprakasam (Indian Institute of Technology Madras, India)

A Study on Oxygen Saturation Images Constructed from the Skin Tissue of Human Hand *58*
Hsin-Yi Tsai (Instrument Technology Research Center, Taiwan)
Kuo-Cheng Huang (Instrument Technology Research Center, Taiwan)
Han-Chao Chang (Instrument Technology Research Center, Taiwan)
Chung-Hsing Chang (Kaohsiung Medical University, Taiwan)

A Genetic Algorithm Approach for Parameter Estimation of HIV Dynamic Model ..... N/A
Han He (Huazhong University of Science and Technology, P.R. China)
Huan Qi (Huazhong University of Science and Technology, P.R. China)

A Low-Cost Platform for Voice Monitoring *67*
A.Carullo (Politecnico di Torino, Italy)
A.Vallan (Politecnico di Torino, Italy)
A.Astolfi (Politecnico di Torino, Italy)

PS1D (Poster Session): Sensors and Sensor Fusion
Room: Pavilion
Chair: *Yi-Jiun Huang* (Telecommunication Laboratories, Chunghwa Telecom Co., Ltd., Taiwan)

Dynamic Range Extension of CMOS Active Pixel Sensor Using a Negative Feedback Structure ... N/A
Sung-Hyun Jo (Kyungpook National University, Korea)
Myunghan Bae (Kyungpook National University, Korea)
Hee Ho Lee (Kyungpook National University, Korea)
Minho Lee (Kyungpook National University, Korea)
Ju-Yeong Kim (Kyungpook National University, Korea)
Jang-Kyoo Shin (Kyungpook National University, Korea)

An Auction Based Agency for Demand Side Management System: an Evaluation..... *77*
Vincenzo Di Lecce (Politecnico di Bari, Italy)
Alessandro Quarto (Dyrecta Lab Srl, Italy)
Angelo Galiano (Dyrecta Lab Srl, Italy)
Michele Dassisti (Politecnico di Bari, Italy)
Michela Chimienti (Laboratorio KAD3 Scarl, Italy)

A Wireless Volatile Organic Absorption pH Sensor Using A Mixed Metal Oxide Electrode *83*
Cameron A. MacGregor (University of Manitoba, Canada)
Sharmistha Bhadra (University of Manitoba, Canada)
Khalada Perveen (University of Manitoba, Canada)
Malcolm M. Q. Xing (University of Manitoba, Canada)
Greg E. Bridges (University of Manitoba, Canada)
Douglas J. Thomson (University of Manitoba, Canada)

Surface State Model for Metal Oxide p-Type Conductometric CO Sensors *88*
Tommaso Addabbo (University of Siena, Italy)
Francesco Bertocci (University of Siena, Italy)
Ada Fort (University of Siena, Italy)
Marco Mugnaini (University of Siena, Italy)
Santina Rocchi (University of Siena, Italy)
Valerio Vignoli (University of Siena, Italy)

Autonomous Bistable Microsensors for Noninvasive AC Electrical Current Measurements *93*
B. Andò (University of Catania, Italy)
S. Baglio (University of Catania, Italy)
G. L'Episcopo (University of Catania, Italy)
F. Maiorca (University of Catania, Italy)
C. Trigona (University of Catania, Italy)

PS1E (Poster Session): Signal and Image Processing Techniques
Room: Pavilion
Chair: *Laurent Vanbeylen (Vrije Universiteit Brussel, Belgium)*

Principal Component Analysis Preprocessing with Bayesian Networks for Battery Capacity Estimation *98*
Liessman E. Sturlaugson (Montana State University, USA)
John W. Sheppard (Montana State University, USA)

A Compressive Sampling Based Method for Power Measurement of Band-Pass Signals *102*
Leopoldo Angrisani (Università degli Studi di Napoli Federico II)
F. Bonavolontà (Università degli Studi di Napoli Federico II)
M. D'Apuzzo (Università degli Studi di Napoli Federico II)
Rosario Schiano Lo Moriello (Università degli Studi di Napoli Federico II, Italy)
Michele Vadursi (Università degli Studi di Napoli Parthenope)

Improved, user-friendly initialization for the identification of the nonlinear LFR block-oriented model *108*
Laurent Vanbeylen (Vrije Universiteit Brussel, Belgium)

An Alternative Recovery Algorithm Based on SL0 for Multiband Signals *114*
Xiyuan Peng (Harbin Institute of Technology, P.R. China)
Miao Zhang (Harbin Institute of Technology, P.R. China)
Jingchao Zhang (Harbin Institute of Technology, P.R. China)
Hongpeng Li (Beijing Institute of Remote Sensing Equipment, P.R. China)
Ning Fu (Harbin Institute of Technology, P.R. China)
Liyan Qiao (Harbin Institute of Technology, P.R. China)
Hongwei Xu (Harbin Institute of Technology, P.R. China)

A novel spectral subtraction technique for cognitive radios *118*
Wendy Van Moer (Vrije Universiteit Brussel, Belgium)
Kurt Barbé (Vrije Universiteit Brussel, Belgium)
Niclas Björsell (University of Gävle, Sweden)

PS1F (Poster Session): Measurement of Electric and Magnetic Quantities
Room: Pavilion
Chair: *Laurent Vanbeylen (Vrije Universiteit Brussel, Belgium)*

Complex permittivity of vermiculite at L- Band upper frequencies *122*
Ivson F. dos Anjos (Federal University of Paraíba, Brazil)
G. Fontgalland (Federal University of Campina Grande, Brazil)
Silvio E. Barbin (University of São Paulo, Brazil)

On the Suitability of Compressive Sampling for the Measurement of Electrical Power Quality.... *126*
F. Bonavolontà (Università degli Studi di Napoli Federico II, Italy)
M. D'Arco (Università degli Studi di Napoli Federico II, Italy)
G. Ianniello (Università degli Studi di Napoli Federico II, Italy)
A. Liccardo (Università degli Studi di Napoli Federico II, Italy)
R. Schiano Lo Moriello (Università degli Studi di Napoli Federico II, Italy)
L. Ferrigno (Università degli Studi di Cassino e del Lazio Meridionale, Italy)
M. Laracca (Università degli Studi di Cassino e del Lazio Meridionale, Italy)
G. Miele (Università degli Studi di Cassino e del Lazio Meridionale, Italy)

Towards a Hybrid Current Monitoring System: Nickel and GMM Comparison as Magnetostrictive Transducers..... *132*
Fábio Vieira Batista de Nazaré (Universidade Federal do Rio de Janeiro, Brazil)
Marcelo Martins Werneck (Universidade Federal do Rio de Janeiro, Brazil)

Preliminary Study of Mutual Coupling Effect on a Passive RFID Antenna Array *138*
Shadi Ebrahimi Asl (Missouri University of Science and Technology, USA)
Mohammad Tayeb Ghasr (Missouri University of Science and Technology, USA)
Maciej Zawodniok (Missouri University of Science and Technology, USA)
Kevin Eugene Robinson (Missouri University of Science and Technology, USA)

Use of an Inductive Divider for AC Voltage Ratio Calibration..... *142*
Karel Draxler (Czech Technical University in Prague, Czech Republic)
Renata Styblíková (Czech Metrology Institute, Czech Republic)

PS1G (Poster Session): Advances in Instrumentation and Measurement Developments and Techniques
Room: Pavilion
Chair: *Matthew Harker (University of Leoben, Austria)*

Instrumentation for the 3D Measurement of Circular Disks and the Quantification of Warpage... *146*
Marian Janko (University of Leoben, Austria)
Paul O'Leary (University of Leoben, Austria)
Matthew Harker (University of Leoben, Austria)

Detection of the impedance variation for nuclear control cable using time frequency domain reflectometry *151*
Seung Jin Chang (Yonsei University, Korea)
Chun Ku Lee (Yonsei University, Korea)
Sin Ho Lee (Yonsei University, Korea)
Jin Bae Park (Yonsei University, Korea)

Characterization of Multi Pixel Photon Counter (MPPC) Array. Statistical approach..... *157*
Orlando Soto (Universidad Tecnica Federico Santa Maria, Chile)
Rimsky Rojas (Universidad Tecnica Federico Santa Maria, Chile)
Sergey Kuleshov (Universidad Tecnica Federico Santa Maria, Chile)
Hayk Hakobyan (Universidad Tecnica Federico Santa Maria, Chile)
Alam Toro (Universidad Tecnica Federico Santa Maria, Chile)
William K. Brooks (Universidad Tecnica Federico Santa Maria, Chile)
Manuel Olivares (Universidad Tecnica Federico Santa Maria, Chile)

Analysis of the Effect of DAC Resolution on RMS Value of the Signal Generated by the Digital Source of Low-Frequency Standard AC Voltage..... *162*
Marian Kampik (Silesian University of Technology, Poland)

Procedure for Radio Noise Measurement in Medium Wave Band ***166***
Iratxe Landa (University of the Basque Country, Spain)
Manuel Maria Velez (University of the Basque Country, Spain)
Amaia Arrinda (University of the Basque Country, Spain)

PS1H (Poster Session): Energy and Power Systems
Room: Pavilion
Chair: *Matthew Harker (University of Leoben, Austria)*

Measuring power systems load conditions through data segmentation ***172***
Massimo D'Apuzzo (University of Naples Federico II, Italy)
Mauro D'Arco (University of Naples Federico II, Italy)
Giacomo Ianniello (University of Naples Federico II, Italy)
Annalisa Liccardo (University of Naples Federico II, Italy)

Measurement of a health index for Li-Ion batteries ***177***
George Gross (University of Illinois at Urbana-Champaign, USA)
Marco Landi (University of Salerno, Italy)

Full Four Capacitor Circuit Compensation for Inductive Power Transfer ***183***
R. Azambuja (Universidade Federal do Rio Grande do Sul, Brazil)
V. J. Brusamarello (Universidade Federal do Rio Grande do Sul, Brazil)
S. Haffner (Universidade Federal do Rio Grande do Sul, Brazil)
R. W. Porto (Universidade Federal do Rio Grande do Sul, Brazil)

Measurement and Verification of Photovoltaic (PV) Simulation Models ***188***
Christian Schuss (University of Oulu, Finland)
Bernd Eichberger (Graz University of Technology, Austria)
Timo Rahkonen (University of Oulu, Finland)

A Medium Voltage Signal Generator for the Testing of Voltage Measurement Transducers ***194***
Marco Faifer (Politecnico di Milano, Italy)
Roberto Ottoboni (Politecnico di Milano, Italy)
Sergio Toscani (Politecnico di Milano, Italy)
Claudio Cherbaucich (RSE S.p.A., Italy)
Mario Gentili (RSE S.p.A., Italy)
Paolo Mazza (RSE S.p.A., Italy)

10:15 - 12:20
S1A: Measurement and Instrumentation for Industrial Applications
Room: Great Hall
Chair: *Yong Yan (University of Kent, United Kingdom)*

Multichannel Ultrasound Instrumentation for On-line Monitoring of Power Transformers with Internal Fiber Optic Sensors ***200***
Julio E. Posada Roman (Universidad Carlos III de Madrid, Spain)
José A. Garcia-Souto (Universidad Carlos III de Madrid, Spain)
Jesús Rubio Serrano (Universidad Carlos III de Madrid, Spain)
Iago Búa Núñez (Universidad Carlos III de Madrid, Spain)

Optimal Placement for Robust Distributed Measurement Systems in Active Distribution Grids .. *206*
Junqi Liu (RWTH Aachen University, Germany)
Ferdinanda Ponci (RWTH Aachen University, Germany)
Antonello Monti (RWTH Aachen University, Germany)
Carlo Muscas (University of Cagliari, Italy)
Paolo Attilio Pegoraro (University of Cagliari, Italy)
Sara Sulis (University of Cagliari, Italy)

An Air-Gap Torque Based Method for Efficiency Evaluation Using PSO to Estimate a New Concept of Stator Resistance Including the Losses Effect *212*
Camila Paes Salomon (Universidade Federal de Itajubá & PS Soluções, Brazil)
Wilson Cesar Santana (Universidade Federal de Itajubá, Brazil)
Luiz Eduardo Borges da Silva (Universidade Federal de Itajubá, Brazil)
Erik Leandro Bonaldi (PS Soluções, Brazil)
Levy Ely de Lacerda de Oliveira (PS Soluções, Brazil)
Jonas Guedes Borges da Silva (Federal University of Itajuba, Brazil)
Germano Lambert-Torres (PS Soluções, Brazil)
Antônio Roberto Donadon (CPFL, Brazil)

Simulation and Laboratory Characterization of a Hybrid MPPT technique based on the Fast Estimate of the Maximum Power Voltages in PV applications..... *218*
Marco Balato (Second University of Naples, Italy)
Daniele Gallo (Second University of Naples, Italy)
Carmine Landi (Second University of Naples, Italy)
Mario Luiso (Second University of Naples, Italy)
Massimo Vitelli (Second University of Naples, Italy)

Rotational Speed Measurement Using Electrostatic Sensors and Correlation Signal Processing Techniques *224*
Lijuan Wang (North China Electric Power University, P.R. China)
Yong Yan (University of Kent, United Kingdom)
Yonghui Hu (North China Electric Power University, P.R. China)
Xiangchen Qian (North China Electric Power University, P.R. China)

S1B: Biomedical Systems
Room: Hiawatha 1
Chair: *Marco Parvis (Politecnico di Torino, Italy)*

Biodegradable metallic materials: a measuring approach to predict the corrosion rate..... *228*
Marco Parvis (Politecnico di Torino, Italy)
Franco Ferraris (Politecnico di Torino, Italy)
Sabrina Grassini (Politecnico di Torino, Italy)
Emma Angelini (Politecnico di Torino, Italy)
Daniele Fulginiti (Politecnico di Torino, Italy)

A Low-Cost Harmonic Radar for Tracking Very Small Tagged Amphibians *234*
Herbert Aumann (University of Maine, USA)
Evan Kus (University of Maine, USA)
Brittany Cline (University of Maine, USA)
Nuri W. Emanetoglu (University of Maine, USA)

A Fast Method for Mobile Robot Transportation in Life Science Automation..... *238*
Hui Liu (University of Rostock, Germany)
Norbert Stoll (Center for Life Science Automation, Germany)
Steffen Junginger (University of Rostock, Germany)
Kerstin Thurow (Center for Life Science Automation, Germany)

Calibration and Validation of Homeostasis Parameters Estimates Produced by a DSP Embedded in a Wheelchair ***243***
Eduardo C Pinheiro (Instituto de Telecomunicações & Instituto Superior Técnico, Portugal)
Octavian A. Postolache (Instituto de Telecomunicações, ISCTE-IUL, Portugal)
Pedro Silva Girão (Instituto de Telecomunicações, DEEC/IST/UTL, Portugal)

Concurrent Wireless Physiological Signal Monitoring System for Multiple Freely Moving Rats .. ***249***
Hai-Yin Teng (National Cheng Kung University, Taiwan)
You-De Liu (National Cheng Kung University, Taiwan)
Da-Wei Chang (National Cheng Kung University, Taiwan)
Chung-Ping Young (National Cheng Kung University, Taiwan)
Sheng-Fu Liang (National Cheng Kung University, Taiwan)
Fu-Zen Shaw (National Cheng Kung University, Taiwan)

S1C: Wireless Sensors and Systems
Room: Hiawatha 2
Chair: *Greg E Bridges (University of Manitoba, Canada)*

Extended Round-Robin TDMA Scheduling Scheme for Wireless Sensor Networks ***253***
Gergely Vakulya (University of Pannonia, Hungary)
Gyula Simon (University of Pannonia, Hungary)

New test bench for evaluation of IEEE 802.15.4 CSS timestamping capabilities ***259***
P. Ferrari (University of Brescia, Italy)
A. Flammini (University of Brescia, Italy)
E. Sisinni (University of Brescia, Italy)
A. Depari (University of Brescia, Italy)
M. Rizzi (University of Brescia, Italy)
R.Exel (Austrian Academy of Sciences, Austria)
T. Sauter (Austrian Academy of Sciences, Austria)

Magnetic-based vehicle detection with sensor networks ***265***
Bence Koszteczky (University of Pannonia, Hungary)
Gyula Simon (University of Pannonia, Hungary)

Efficiency Modeling of Class-E Power Oscillators for Wireless Energy Transfer **271**
R.L.O. Pinto (CTI Design House, Brazil)
R.M. Duarte (UFSC, Brazil)
F.R. Sousa (UFSC, Brazil)
I. Müller (UFRGS, Brazil)
V.J. Brusamarello (UFRGS, Brazil), Brazil)

Wireless Passive Sensor for pH Monitoring inside a Small Bioreactor ***276***
Sharmistha Bhadra (University of Manitoba, Canada)
Chris Dynowski (University of Manitoba, Canada)
Warren Blunt (University of Manitoba, Canada)
Mike McDonald (University of Manitoba, Canada)
Douglas J. Thomson (University of Manitoba, Canada)
Michael Freund (University of Manitoba, Canada)
Nazim Cicek (University of Manitoba, Canada)
Greg E. Bridges (University of Manitoba, Canada)

S1D: Non-Invasive Measurement Techniques and Instrumentation
Room: Hiawatha 3
Chair: *Tuami Lasri (IEMN - University of Lille, France)*

A Neural Network-based Method for Continuous Blood Pressure Estimation from a PPG Signal ***280***
Yuriy Kurylyak (University of Calabria, Italy)
Francesco Lamonaca (University of Calabria, Italy)
Domenico Grimaldi (University of Calabria, Italy)

A novel biaxial probe implementing multifrequency excitation and SVM processing for NDT ***284***
Andrea Bernieri (University of Cassino, Italy)
Giovanni Betta (University of Cassino, Italy)
Luigi Ferrigno (University of Cassino, Italy)
Marco Laracca (University of Cassino, Italy)

Measuring transmission lines parameters in the frequency domain ***290***
Guido d'Alessandro (University of Naples Federico II, Italy)
Mauro D'Arco (University of Naples Federico II, Italy)
Michele Vadursi (University of Naples "Parthenope", Italy)

Remote Field Eddy Current Inspection of Metallic Tubes Using GMR Sensors ***296***
Dário J. Pasadas (Instituto Telecomunicações / Instituto Superior Técnico, Portugal)
Tiago J. Rocha (Instituto de Telecomunicações / Instituto Superior Técnico, Portugal)
Helena G. Ramos (Instituto de Telecomunicações / Instituto Superior Técnico, Portugal)
A. Lopes Ribeiro (Instituto de Telecomunicações / Instituto Superior Técnico, Portugal)

Experimental Validation of an Ultrasound-Based Measurement System for Human Motion Detection and Analysis ***300***
Roberto Ricci (University of Padova, Italy)
Alessandro Sona (University of Padova, Italy)

S1E: Data Acquisition Systems and Techniques
Room: Rock Island
Chair: *Pasquale Daponte (University of Sannio, Italy)*

Uncertainty analysis of a superregenerative pulse-width programmable gain amplifier ***306***
Anderson Paiva de Figueiredo (Universidade Federal do Rio Grande do Norte, Brazil)
Sebastian Yuri Cavalcanti Catunda (Federal University of Rio Grande do Norte, Brazil)
Fernando Rangel de Sousa (Federal University of Santa Catarina, Brazil)

Split ADC Background Self-Calibration of a 16-b Successive Approximation ADC in 180nm CMOS ***310***
John McNeill (Worcester Polytechnic Institute, USA)
Christopher David (MIT Lincoln Laboratory, USA)
Michael C. W. Coln (Analog Devices, USA)
Ka Yan Chan (Analog Devices, USA)
Cody Brenneman (Analog Devices, USA)

Experimental setup for distortion evaluation of exponential signal ***314***
D.L. Carnì (University of Calabria, Italy)
D. Grimaldi (University of Calabria, Italy)
L. Michaeli (Technical University of Košice, Slovak Republic)
J. Šaliga (Technical University of Košice, Slovak Republic)
J. Lipták (Technical University of Košice, Slovak Republic)

Multisine Excitation Design Using Synchronous Square Wave Sources ***319***
Michael J. Schmitz (North Dakota State University, USA)
Roger A. Green (North Dakota State University, USA)

Analysis of Tintoretto's paintings in the Scuola Grande di San Rocco by an Image Spectrometer ***323***
Pietro Fiorentin (University of Padova, Italy)
Elena Pedrotti (University of Padova, Italy)
Alessandro Scroccaro (University of Padova, Italy)

1:35 - 3:40
S2A: Measurement and Instrumentation for Industrial Applications
Room: Great Hall
Chair: *Pavel Procházka (Institute of Thermomechanics AS CR, v. v. i., Czech Republic)*

20A Trapezoidal Reference Current Pulse Generator for the Evaluation of Current Transducers ***328***
Miguel Cerqueira Bastos (CERN, Switzerland)
Michele Martino (CERN, Switzerland)
Gustavo Cesar Uicich (Universidad Nacional de Mar del Plata, Argentina)
Pablo Daniel Antoszczuk (Universidad Nacional de Mar del Plata, Argentina)
John R. P. Pickering (Metron Designs Ltd, United Kingdom)

Holdup Estimation in Core Flow Using Image Processing ***334***
Adriana Bonilla Riaño (University of Campinas, Brazil)
Antonio Carlos Bannwart (University of Campinas, Brazil)
Oscar M. H. Rodriguez (University of Sao Paulo, Brazil)

New Methods of Non-Contact Sensing of Blade Vibrations and Deflections in Turbomachinery . ***339***
Pavel Procházka (Institute of Thermomechanics, Academy of Sciences of the Czech Republic)
František Vaněk (Institute of Thermomechanics, Academy of Sciences of the Czech Republic)

Effect of Current Resampling in Motor Current Signature Analysis ***345***
Levent Eren (Izmir University of Economics, Turkey)
Michael J. Devaney (University of Missouri-Columbia, USA)

Statistical modelling of measured automotive radar reflections ***349***
W. Buller (Michigan Technological University, USA)
B. Wilson (Michigan Technological University, USA)
L. van Nieuwstadt (Michigan Technological University, USA)
J. Ebling (Michigan Technological University, USA)

S2B: Signal and Image Processing Techniques
Room: Hiawatha 1
Chair: *Consolatina Liguori (University of Salerno, Italy)*

Increasing the Robustness of the Resonator Based ADC Testing ***353***
Tamás Dabóczi (Budapest University of Technology and Economics, Hungary)

Automated Wire Fault Location Using Impedance Spectroscopy and Differential Evolution ***359***
Qinghai Shi (Chemnitz University of Technology, Germany)
Olfa Kanoun (Chemnitz University of Technology, Germany)

Identification of Nonlinear LFR Systems with Two Nonlinearities ***365***
Anne Van Mulders (Vrije Universiteit Brussel, Belgium)
Laurent Vanbeylen (Vrije Universiteit Brussel, Belgium)

A Measurement Algorithm for Frequency Agility in Cognitive Radio *371*
L. Angrisani (University of Naples Federico II, Italy)
D. Capriglione (University of Cassino, Italy)
L. Ferrigno (University of Cassino, Italy)
G. Miele (University of Cassino, Italy)

A Real-time Method for DSM Generation from Airborne LiDAR Data *377*
Deming Kong (Beihang University, P.R. China)
Lijun Xu (Beihang University, P.R. China)
Xiaolu Li (Beihang University, P.R. China)
Shuyang Li (University of Science and Technology Beijing, P.R. China)

2:25 - 3:40
SS1 (Part 1): Millimeter Wave, Microwave, and Terahertz: Devices, Methods, Applications, and Measurements
Room: Hiawatha 2
Chair: *Kristen M Donnell (Missouri University of Science and Technology, USA)*

Sensitivity Analysis of A Single-Port Vector Reflectometer with A Wideband Phase-Shifter *381*
A. Kothari (Missouri University of Science and Technology, USA)
M. T. Ghasr (Missouri University of Science and Technology, USA)
R. Zoughi (Missouri University of Science and Technoogy, USA)

A Novel Interferometric Millimeter Wave Doppler Radar Architecture *387*
Shaolin Liao (Argonne National Laboratory, USA)
N. Gopalsami (Argonne National Laboratory, USA)
S. Bakhtiari (Argonne National Laboratory, USA)
T.Elmer (Argonne National Laboratory, USA)
A. C. Raptis (Argonne National Laboratory, USA)

Application of Electrically Invisible Antennas to the Modulated Scatterer Technique *392*
Dylan A. Crocker (Missouri University of Science and Technology, USA)
Kristen M. Donnell (Missouri University of Science and Technology, USA)

SS2 (Part 1): Emerging Methods for Measuring, Modeling, and Instrumentation in Medical Applications
Room: Hiawatha 3
Chairs: *Kurt Barbé (VUB, Belgium), Wendy Van Moer (Vrije Universiteit Brussel, Belgium)*

Non-Invasive Measurement of Heartbeat with a Hydraulic Bed Sensor: Progress, Challenges, and Opportunities *397*
David Heise (Lincoln University, USA)
Licet Rosales (University of Missouri, USA)
Mary Sheahen (University of Missouri, USA)
Bo-Yu Su (University of Missouri, USA)
Marjorie Skubic (University of Missouri, USA)

Microfluidic Device for Simultaneous Pulsed Electric Field Electroporation and Dielectrophoresis Studies of Single Biological Cells *403*
Elham Salimi (University of Manitoba, Canada)
Marija Nikolic-Jaric (University of Manitoba, Canada)
Tim Cabel (University of Manitoba, Canada)
Katrin Braasch (University of Manitoba, Canada)
Vincent Jung (University of Manitoba, Canada)
Michael Butler (University of Manitoba, Canada)
Douglas J. Thomson (University of Manitoba, Canada)
Greg E. Bridges (University of Manitoba, Canada)

Design of a capacitive ECG sensor for unobtrusive heart rate measurements *407*
Amaya Arcelus (University of Toronto, Canada)
Mohammed Sardar (University of Toronto, Canada)
Alex Mihailidis (University of Toronto, Canada)

1:35 - 3:40
SS3 (Part 1): Instrumentation and Measurement for Improving Quality, Reliability and Safety
Room: Rock Island
Chair: *Marcantonio Catelani (University of Florence, Italy)*

Classification and analysis of failures of ultracapacitors in rail launchers applications *411*
Mirko Marracci (University of Pisa, Italy)
Bernardo Tellini (University of Pisa, Italy)
Roberto Ferrero (University of Pisa, Italy)
Marcantonio Catelani (University of Florence, Italy)
Lorenzo Ciani (University of Florence, Italy)

Wide-band and Narrow-band Characterization of the Propagation Channel in Trains ..... *N/A*
Andrea Mariscotti (University of Genoa, Italy)
Attilio Marrese (University of Naples Federico II, Italy)
Nicola Pasquino (University of Naples Federico II, Italy)
Rosario Schiano Lo Moriello (University of Naples Federico II, Italy)

Electronic Circuit Fault Diagnosis Methods based on Improved Support Vector Machines..... *422*
Yang Zhiming (Harbin Institute of Technology, P.R. China)
Yang Yu (Harbin Institute of Technology, P.R. China)
Gang Wang (Harbin Institute of Technology, P.R. China)

Availability Modeling of A Safe Communication System for Rolling Stock Applications..... *427*
Ada Fort (University of Siena, Italy)
Francesco Bertocci (University of Siena, Italy)
Marco Mugnaini (University of Siena, Italy)
Valerio Vignoli (University of Siena, Italy)
Vittorio Gaggii (Comesa SrL, Italy)
Alessandro Galasso (Comesa SrL, Italy)
Moreno Pieralli (Comesa SrL, Italy)

Cough Sound Discrimination in Noisy Environments using Microphone Array..... *431*
Payam Moradshahi (Carleton University, Canada)
Hanieh Chatrzarrin (Carleton University, Canada)
Rafik Goubran (Carleton University, Canada)

3:40 - 6:05
PS2A (Poster Session): Measurement Applications
Room: Pavilion
Chair: *Hui Liu (University of Rostock, Germany)*

An Application of Charging Management for Mobile Robot Transportation in Laboratory Environments ***435***
Hui Liu (University of Rostock, Germany)
Norbert Stoll (Center for Life Science Automation, Germany)
Steffen Junginger (University of Rostock, Germany)
Kerstin Thurow (Center for Life Science Automation, Germany)

Resonant Frequency Analysis for Spring-mass Structure in High-g MEMS Accelerometer ***440***
Zhenya Geng (Harbin Institute of Technology, P.R. China)
Yi Shen (Harbin Institute of Technology, P.R. China)
Miao Zhang (Harbin Institute of Technology, P.R. China)
Muhua Li (Harbin Institute of Technology, P.R. China)
Jing Jin (Harbin institute of Technology, P.R. China)

Characterization of Motorcycle Suspension Systems: Comfort and Handling Performance Evaluation ***444***
Consolatina Liguori (University of Salerno, Italy)
Vincenzo Paciello (University of Salerno, Italy)
Alfredo Paolillo (University of Salerno, Italy)
Antonio Pietrosanto (University of Salerno, Italy)
Paolo Sommella (University of Salerno, Italy)

Review of signal processing techniques for detection of transient disturbances in voltage supply systems ***450***
Julio Barros (University of Cantabria, Spain)
Matilde Apraiz (University of Cantabria, Spain)
Ramón I. Diego (University of Cantabria, Spain)

Measurement of transmissibility on individuals ***456***
Alexandre Balbinot (Federal University of Rio Grande do Sul, Brazil)
Adalberto Schuck, Jr. (Federal University of Rio Grande do Sul, Brazil)
Yuri Bruxel (Federal University of Rio Grande do Sul, Brazil)

PS2B (Poster Session): Advances in Instrumentation and Measurement Developments and Techniques
Room: Pavilion
Chair: *Hui Liu (University of Rostock, Germany)*

Phase Noise and Transient Measurement Methods for V-band Applications ***461***
Ya-Wen Ou (National Applied Research Laboratories, Taiwan)
Sy-Haur Su (National Applied Research Laboratories, Taiwan)
Yin-Cheng Chang (National Applied Research Laboratories, Taiwan)
Shuw-Guann Lin (National Applied Research Laboratories, Taiwan)
Hsu-Chen Cheng (National Applied Research Laboratories, Taiwan)
Ying-Zong Juang (National Applied Research Laboratories, Taiwan)
Da-Chiang Chang (National Applied Research Laboratories, Taiwan)
Hwann-Kaeo Chiou (National Central University, Taiwan)

Analytic Redundance applied to the Relay-Connected Instrumentation of Electric Power Distribution Substations ***465***
Joao Viana da Fonseca Neto (Universidade Federal do Maranhão, Brazil)
Ronnie S. Loureiro (Companhia Energética do Maranhão, Brazil)
Ernesto Franklin Marcal Ferreira (Universidade Federal do Maranhão, Brazil)

Unique Hues: a Possible Base for the Evaluation of Colour Appearance Quality ***471***
Osvaldo da Pos (University of Padova, Italy)
Pietro Fiorentin (University of Padova, Italy)

Separation of Electromagnetic Sources by the Method of Independent Component Analysis ***476***
Paulo Ixtânio Leite Ferreira (Federal Inst. of Science and Tec. of Paraíba, IFPB, Brazil)
Glauco Fontgalland (Federal University of Campina Grande, UFCG, Brazil)
Galba F. Aragão (Federal University of Campina Grande, UFCG, Brazil)
Silvio E. Barbin (University of São Paulo, USP, Brazil)

Novel Time-Interleaved Variable-Center Frequency Σ-Δ Modulators−Design, Analysis and Critical Evaluation ***480***
Isil Kalafat Kizilkaya (University of Westminster, United Kingdom)
Mohammed Al-Janabi (University of Westminster, United Kingdom)
Izzet Kale (University of Westminster, United Kingdom)

PS2C (Poster Session): Measurement and Instrumentation for Industrial Applications
Room: Pavilion
Chair: *Brian Wilson (Michigan Technological University, USA)*

Temperature Measurement System for Train Rheostat ***484***
Michele Norgia (Politecnico di Milano, Italy)
Alessandro Pesatori (Politecnico di Milano, Italy)
Angelo Colombo (Alstom Ferroviaria S.p.A., Italy)

A Proposal for an Open Source Energy Meter ***488***
F. Adamo (Polytechnic of Bari, Italy)
G. Cavone (Politecnico di Bari, Italy)
A. Di Nisio (Politecnico di Bari, Italy)
A.M.L. Lanzolla (Politecnico di Bari, Italy)
M. Spadavecchia (Politecnico di Bari, Italy)

WLS Distribution System State Estimator Based on Voltages or Branch Currents: Accuracy and Performance Comparison ***493***
M. Pau (University of Cagliari, Italy)
P.A. Pegoraro (University of Cagliari, Italy)
S. Sulis (University of Cagliari, Italy)

Wind Speed Measurement based on Ultrasonic Sensors using Discrete Fourier Transform ***499***
Maxwell M. Costa (Federal Institute of Tocantins – Palmas, Brazil)
Raimundo Carlos S. Freire (Federal University of Campina Grande, Brazil)
Sebastian Y.C. Catunda (Federal University of Rio Grande do Norte, Brazil)
Juan M. Mauricio Villanueva (Federal University of Paraíba, Brazil)

A Low-Cost Ultrasonic Wind Speed and Direction Measurement System *505*
G.Bucci (Università degli Studi dell'Aquila, Italy)
F. Ciancetta (Università degli Studi dell'Aquila, Italy)
E. Fiorucci (Università degli Studi dell'Aquila, Italy)
D. Gallo (Seconda Università degli Studi di Napoli, Italy)
C. Landi (Seconda Università degli Studi di Napoli, Italy)
M. Luiso (Seconda Università degli Studi di Napoli, Italy)

PS2D (Poster Session): Energy and Power Systems
Room: Pavilion
Chair: *Brian Wilson (Michigan Technological University, USA)*

Increase of PLC Computability with Neural Network for Recovery of Faults in Electrical Distribution Substation *511*
Joao V. Fonseca Neto (University Federal of Maranhão, Brazil)
Ernesto F. M. Ferreira (University Federal of Maranhão, Brazil)

New Measurement Procedure for Load Flow Evaluation in Medium Voltage Smart Grids *517*
Antonio Cataliotti (Università di Palermo, Italy)
Pierluca Russotto (Università di Palermo, Italy)
Dario Di Cara (National Research Council (CNR), Institute of Intelligent System for Automation (ISSIA), Italy)
Enrico Telaretti (National Research Council (CNR), Institute of Intelligent System for Automation (ISSIA), Italy)
Giovanni Tinè (National Research Council (CNR), Institute of Intelligent System for Automation (ISSIA), Italy)

Cast-Resin Dry-type Transformer Partial Discharge Signal Analysis using Spectral Correlated Empirical Mode Decomposition Method *523*
Ya-Wen Tang (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Ching-Chau Su (Nan Jeon Institute of Technology, Taiwan)
Cheng-Chi Tai (National Cheng Kung University, Taiwan)
Jiann-Fuh Chen (National Cheng Kung University, Taiwan)

Designing an Energy Measurement System for an Electric Vehicle Competition – From a Student Project to a Successful Race *528*
Joonas P. Talvitie (Lappeenranta University of Technology, Finland)
Tommi J. Kärkkäinen (Lappeenranta University of Technology, Finland)
Jari Koskinen (Lappeenranta University of Technology, Finland)
Manu Niukkanen (Lappeenranta University of Technology, Finland)
Juha-Pekka Ström (Lappeenranta University of Technology, Finland)
Pertti Silventoinen (Lappeenranta University of Technology, Finland)
Mikko Kuisma (Lappeenranta University of Technology, Finland)

Hierarchical Sparse Learning for Load Forecasting in Cyber-Physical Energy Systems *533*
Xinyao Sun (Tsinghua University, P.R. China)
Xue Wang (Tsinghua University, P.R. China)
Jiangwei Wu (Tsinghua University, P.R. China)
Youda Liu (Tsinghua University, P.R. China)

PS2E (Poster Session): Signal and Image Processing Techniques
Room: Pavilion
Chair: *Wuliang Yin (University of Manchester, United Kingdom)*

Application of the Method of Auxiliary Source to the Sensitivity Analysis of High Frequency Magnetic Induction Tomography System *539*
Qian Zhao (Tianjin University, P.R. China)
Jianna Hao (Tianjin University, P.R. China)
Guang Chen (Tianjin University, P.R. China)
Xu Kai (Tianjin University, P.R. China)
Wuliang Yin (University of Manchester, United Kingdom)

LHC magnet quench detection by trend analysis of the pressure signal *545*
Sylvie Charbonnier (Gipsa-lab, Université Joseph Fourier, France)
Adriaan Rijllart (CERN, Switzerland)
Philippe Gayet (CERN, Switzerland)

Modulation Method for minimizing the Depth Distortion Offset of Lock-in TOF Cameras *551*
Stephan Hussmann (West Coast University of Applied Sciences, Germany)
Florian Knoll (West Coast University of Applied Sciences, Germany)

An automatic image segmentation scheme for phalanx and epiphyseal/metaphyseal region of interests *557*
Chih-Yen Chen (Instrument Technology Research Center, Taiwan)
Chi-Wen Hsieh (National Chiayi University, Taiwan)
Tzu-Chiang Liu (Taipei Veterans General Hospital, Taiwan)
Hung-Chun Chien (Jinwen University of Science and Technology, Taiwan)

An Optimized Relevance Vector Machine with Incremental Learning Strategy for Lithium-ion Battery Remaining Useful Life Estimation *561*
Jianbao Zhou (Harbin Institute of Technology, P.R. China)
Datong Liu (Harbin Institute of Technology, P.R. China)
Yu Peng (Harbin Institute of Technology, HIT, P.R. China)
Xiyuan Peng (Harbin Institute of Technology, P.R. China)

PS2F (Poster Session): Measurement Systems and Theory
Room: Pavilion
Chair: *Wuliang Yin (University of Manchester, United Kingdom)*

CVIS: Complex Virtual Instruments System Architecture *566*
Zhongwen Guo (Ocean University of China, P.R. China)
Chao Liu (Ocean University of China, P.R. China)
Xi Wang (Ocean University of China, P.R. China)
Hongyang Ma (Ocean University of China, P.R. China)
Yongguo Jiang (Ocean University of China, P.R. China)
Bing Zheng (Ocean University of China, P.R. China)
Bo He (Ocean University of China, P.R. China)

To Develop an Optical System Model for Image Based Multi-degree-of-freedom Measurement System ***572***
Chun-Jen Chen (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Chun-Li Chang (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Wen-Tse Hsiao (Instrument Technology Research center, National Applied Research Laboratories, Taiwan)
Min-Wei Hung (Instrument Technology Research center, National Applied Research Laboratories, Taiwan)
Wenyuh Jywe (National Formosa University, Taiwan)
Yunfeng Teng (National Formosa University, Taiwan)

Precise measurement of fibers position using bundle adjustment algorithm ***576***
MingChi Feng (University of Science and Technology of China, P.R. China)
YongGang Gu (University of Science and Technology of China, P.R. China)
Chao Zhai (University of Science and Technology of China, P.R. China)

4:00 - 6:05
S3A: Industrial Process Controls
Room: Great Hall
Chair: *Diego Barrettino (University of Applied Sciences of Southern Switzerland (SUPSI), Switzerland)*

In-Line Capacitive Moisture Sensor for Polymer Industries ***581***
Diego Barrettino (University of Applied Sciences of Southern Switzerland, Switzerland)
Giovanni Badaracco (University of Applied Sciences of Southern Switzerland, Switzerland)
Marco Sala (University of Applied Sciences of Southern Switzerland, Switzerland)
Filippo Piffaretti (University of Applied Sciences of Southern Switzerland, Switzerland)
Marco Sammartini (Bry-Air PROKON SAGL, Switzerland)

On the use of PRIME Powerline Communication in Industrial Applications: Modbus a first testcase ***587***
A. Depari (University of Brescia, Italy)
P. Ferrari (University of Brescia, Italy)
A. Flammini (University of Brescia, Italy)
S. Rinaldi (University of Brescia, Italy)
E. Sisinni (University of Brescia, Italy)
A. Vezzoli (University of Brescia, Italy)

Experimental Platform for Faults Detection in Fuzzy Controllers based on Artificial Immune Systems ***593***
Robson Pacífico Guimarães Lima (Federal Institute of Pernambuco, IFPE, Brazil)
Bruno Willian de Souza Arruda (Federal University of Paraíba, Brazil)
Cleonilson Protásio de Souza (Federal University of Paraiba, Brazil)

Design of Single Sampling Plans by Closed-Form Equations ***597***
Giuseppe Cavone (Politecnico di Bari, Italy)
Nicola Giaquinto (Politecnico di Bari, Italy)
Laura Fabbiano (Polytechnic of Bari, Italy)
Gaetano Vacca (Politecnico di Bari, Italy)

Localization of Leaks in Buried Pipes Through Microwave Reflectometry: A Practical Test Case ***603***
Andrea Cataldo (University of Salento, Italy)
Egidio De Benedetto (University of Salento, Italy)
Giuseppe Cannazza (MoniTech s.r.l. - Monitoring Technologies, Italy)
Marcello Miraglia (Acquedotto Pugliese S pA, Italy)
Danilo Ancora (Acquedotto Pugliese SpA, Italy)
Nicola Giaquinto (Politecnico di Bari, Italy)

S3B: Sensors and Sensor Fusion
Room: Hiawatha 1
Chair: *Alberto Vallan (Politecnico di Torino, Italy)*

Variable Frame Time Imaging for Indirect Time of Flight Range Imaging Cameras ***609***
Benjamin M. M. Drayton (Victoria University of Wellington, New Zealand)
Dale A. Carnegie (Victoria University of Wellington, New Zealand)
Adrian A. Dorrington (University of Waikato, New Zealand)

Planar High-Frequency Contactless Inductive Position Sensor ***614***
Bernhard Aschenbrenner (Johannes Kepler University, Austria)
Bernhard G. Zagar (Johannes Kepler University, Austria)

A Differential Optical Sensor for Long-term Monitoring of Chemicals ***620***
Carmelo Fallauto (Politecnico di Torino, Italy)
Yu Liu (Politecnico di Torino, Italy)
Guido Perrone (Politecnico di Torino, Italy)
Alberto Vallan (Politecnico di Torino, Italy)

In-line Particle Sizing of Pneumatically Conveyed Particles Using a Piezo Film Sensor ***625***
Lingjun Gao (University of Kent, United Kingdom)
Yong Yan (University of Kent, United Kingdom)
Robert M. Carter (University of Kent, United Kingdom)
Duo Sun (University of Kent, United Kingdom)
Chuanlong Xu (University of Kent, United Kingdom)

A New Infrared 3D Camera for Gesture Control ***629***
Dan Ionescu (University of Ottawa, Canada)
Viorel Suse (University of Ottawa, Canada)
Cristian Gadea (University of Ottawa, Canada)
Bogdan Solomon (University of Ottawa, Canada)
Bogdan Ionescu (Mgestyk Technologies, Canada)
Shahidul Islam (Mgestyk Technologies, Canada)

SS1 (Part 2): Millimeter Wave, Microwave, and Terahertz: Devices, Methods, Applications, and Measurements
Room: Hiawatha 2
Chair: *Kristen M Donnell (Missouri University of Science and Technology, USA)*

Broadband Dual Varactor Diode-Loaded Elliptical Slot Antenna with an Orthogonal Feed at K-Band ***635***
M. Baumgartner (Missouri University of Science and Technology, USA)
M.T. Ghasr (Missouri University of Science and Technology, USA)
R. Zoughi (Missouri University of Science and Technoogy, USA)

Novel Tunable Filter for Millimeter-Wave Spectrum Analyzer Over 100 GHz ***641***
Takashi Kawamura (Anritsu Corporation, Japan)
Hiroshi Shimotahira (Anritsu Corporation, Japan)
Akihito Otani (Anritsu Corporation, Japan)

Novel Reflectometer for Millimeter Wave 3D Holographic Imaging ***647***
M.T. Ghasr (Missouri University of Science and Technology, USA)
P. Puleo III (Missouri University of Science and Technology, USA)
R. Zoughi (Missouri University of Science and Technoogy, USA)

Correcting Mutual Coupling and Isolation For a 2-D Real-Time Microwave Camera ***652***
Joseph T. Case (Missouri University of Science and Technology, USA)
M. Tayeb Ghasr (Missouri University of Science and Technology, USA)
Reza Zoughi (Missouri University of Science and Technoogy, USA)

On SNR estimation using IEEE-STD-1057 three-parameter sine wave fit ***658***
Senay Negusse (Signal Processing Lab, ACCESS Linnaeus Center, Sweden)
Peter Händel (Signal Processing Lab, ACCESS Linnaeus Center, Sweden)
Per Zetterberg (Signal Processing Lab, ACCESS Linnaeus Center, Sweden)

SS2 (Part 2): Emerging Methods for Measuring, Modeling, and Instrumentation in Medical Applications
Room: Hiawatha 3
Chairs: *Kurt Barbé (VUB, Belgium), Wendy Van Moer (Vrije Universiteit Brussel, Belgium)*

Comparison of Duty Cycle Measurement Techniques of 802.11b/g in the Frequency and Time Domain ***662***
Nickolas J LaSorte (University of Oklahoma-Tulsa, USA)
Dan Bloom (University of Oklahoma-Tulsa, USA)
Samer Rajab (University of Oklahoma-Tulsa, USA)
Sina Asadallahi (University of Oklahoma-Tulsa, USA)
Hazem H. Refai (University of Oklahoma-Tulsa, USA)
Ruiqiang Zhang (Chongqing University, P.R. China)
Wei He (Chongqing University, P.R. China)

An Implantable Encased Microstrip Ring Rectenna for Wireless Biomedical Applications ***667***
Robert Salama (University of Western Sydney, Australia)
Ranjith Liyanapathirana (University of Western Sydney, Australia)
Upul Gunawardana (University of Western Sydney, Australia)
Sergey Kharkovsky (University of Western Sydney, Australia)

Pulse Signal Analysis Based on Wavelet Packet Transform and Hidden Markov Model Estimation ***671***
Jingjing Meng (Southeast University, P.R. China)
Yuning Qian (Southeast University, P.R. China)
Ruqiang Yan (Southeast University, P.R. China)

Vocal Tract Imaging System for Post-Laryngectomy Voice Replacement *676*
Jun Cai (Université Pierre et Marie Curie, France)
Thomas Hueber (GIPSA Lab, UMR 5216/CNRS/INP/UJF/U.Stendhal, France)
Sotirios Manitsaris (Université Pierre et Marie Curie, France)
Pierre Roussel (SIGMA Laboratory, ESPCI-ParisTech, France)
Lise Crevier-Buchman (Laboratoire Phonétique et Phonologie, France)
Maureen Stone (Univerity of Maryland Dental School, USA)
Claire Pillot-Loiseau (Laboratoire Phonétique et Phonologie, France)
Gérard Chollet (Laboratoire Traitement et Communication de l'Information, France)
Gerard Dreyfus (SIGMA Laboratory, ESPCI-ParisTech, France)
Bruce Denby (Université Pierre et Marie Curie, France)

Modular Platform Architecture for Fast Prototyping of Vital Signs and Motor Activity Monitors.. *681*
Mario Ribeiro (Instituto de Telecomunicações, Portugal)
Octavian Postolache (Instituto de Telecomunicações, Portugal)
Pedro Silva Girão (Instituto de Telecomunicações, Portugal)

SS3 (Part 2): Instrumentation and Measurement for Improving Quality, Reliability and Safety
Room: Rock Island
Chair: *Marcantonio Catelani (University of Florence, Italy)*

Safety Analysis in Oil & Gas Industry in compliance with Standards IEC61508 and IEC61511: Methods and Applications *686*
Marcantonio Catelani (University of Florence, Italy)
Lorenzo Ciani (University of Florence, Italy)
Valentina Luongo (GE OIL&GAS Nuovo Pignone, Italy)

Numerical Simulation and Experimental Study of Z-path Ultrasonic Heat Meter Based on TDC-GP21 ..... *691*
Xiaoyu Tang (Zhejiang University, P.R. China)
Hongjian Zhang (Zhejiang University, P.R. China)
Hongliang Zhou (Zhejiang University, P.R. China)
Binbin Yao (Zhejiang University, P.R. China)

Recursive Cooperative Swarm Optimization for Harmonic Analysis of Time-varying Power Signal..... *696*
Jiangwei Wu (Tsinghua University, P.R. China)
Xue Wang (Tsinghua University, P.R. China)
Youda Liu (Tsinghua University, P.R. China)

A Child-left-behind Warning System based on Capacitive Sensing Principle *702*
Abhishek Ranjan (Indian Institute of Technology Madras, India)
Boby George (Indian Institute of Technology Madras, India)

High Resolution Imaging for Inspection of Laser Beam Melting Systems *707*
Joschka zur Jacobsmühlen (RWTH Aachen University, Germany)
Stefan Kleszczynski (University of Duisburg-Essen, Germany)
Dorian Schneider (RWTH Aachen University, Germany)
Gerd Witt (University of Duisburg-Essen, Germany)

Wednesday, May 8

09:00 - 11:35
PS3A (Poster Session): Sensors and Sensor Fusion
Room: Pavilion
Chair: *Federico Tramarin (CNR & University of Padova, Italy)*

Metamaterial Transmission Line Resonators for Structural Moisture Sensing in Buildings *713*
Andreas Penirschke (Technische Universität Darmstadt, Germany)
Rolf Jakoby (Technische Universität Darmstadt, Germany)

Using an Ultrasound Module to Reduce the Standby Power Consumption of a PC Monitor *717*
Cheng-Hung Tsai (National Taiwan University of Science and Technology, Taiwan)
Ying-Wen Bai (Fu Jen Catholic University, Taiwan)
Kung-Shen Lin (Fu Jen Catholic University, Taiwan)
Li-Chia Cheng (Fu Jen Catholic University, Taiwan)
Roger Jia Rong Jhang (Fu Jen Catholic University, Taiwan)

High Throughput Implementations of Cryptography algorithms on GPU and FPGA..... *723*
Vivek Venugopal (United Technologies Research Center, USA)
Devu Manikantan Shila (United Technologies Research Center, USA)

Self-Mixing Interferometer for Speed Measurement with Sign *728*
Alessandro Magnani (Politecnico di Milano, Italy)
Alessandro Pesatori (Politecnico di Milano, Italy)
Michele Norgia (Politecnico di Milano, Italy)

Efficient Accelerometer-based Event Detector in Wireless Sensor Networks *732*
József Smidla (University of Pannonia, Hungary)
Gyula Simon (University of Pannonia, Hungary)

PS3B (Poster Session): Wireless Sensors and Systems
Room: Pavilion
Chair: *Federico Tramarin (CNR & University of Padova, Italy)*

Wireless Active Guardrail for Traffic Safety: Preliminary Tests of Speed and Proximity Measurement *737*
Pasquale Daponte (University of Sannio, Italy)
Luca De Vito (University of Sannio, Italy)
Sergio Rapuano (University of Sannio, Italy)
Ioan Tudosa (University of Sannio, Italy)

Adding Errors to Reduce the PAPR and BER of OFDM-based Transmissions..... *743*
Niclas Björsell (University of Gävle, Sweden)
Wendy Van Moer (Vrije Universiteit Brussel, Belgium)

Monitoring Dry-Cask Storage Using Thermoelectric Powered Wireless Sensors *747*
Thomas Carstens (University of Wisconsin-Madison, USA)
Michael Corradini (University of Wisconsin-Madison, USA)
James Blanchard (University of Wisconsin-Madison, USA)
Zhenqiang Ma (University of Wisconsin-Madison, USA)

802.11g Channel Characterization Utilizing LabView and NI-USRP *753*
Nikookhoy Shahin (University of Oklahoma-Tulsa, USA)
Nickolas J LaSorte (University of Oklahoma-Tulsa, USA)
Samer A. Rajab (University of Oklahoma-Tulsa, USA)
Hazem H. Refai (University of Oklahoma-Tulsa, USA)

PS3C (Poster Session): Measurement and Instrumentation for Industrial Applications
Room: Pavilion
Chair: *Renata Styblikova (Czech Metrology Institute, Czech Republic)*

Computational Intelligence Models for Solar Radiation Prediction..... *757*
S. Ferrari (Università degli Studi di Milano, Italy)
M. Lazzaroni (Università degli Studi di Milano, Italy)
V. Piuri (Università degli Studi di Milano, Italy)
A. Salman (Dogus University, Istanbul, Turkey)
L. Cristaldi (Politecnico di Milano, Italy)
M. Faifer (Politecnico di Milano, Italy)

Low Cost Smart Power Metering *763*
Daniele Gallo (Second University of Naples, Italy)
Carmine Landi (Second University of Naples, Italy)
Mario Luiso (Second University of Naples, Italy)
Giovanni Bucci (University of L'Aquila, Italy)
Edoardo Fiorucci (University of L'Aquila, Italy)

AC Electronic Load for On-Site Calibration of Energy Meters *768*
Gianluca Aurilio (Second University of Naples, Italy)
Daniele Gallo (Second University of Naples, Italy)
Carmine Landi (Second University of Naples, Italy)
Mario Luiso (Second University of Naples, Italy)

Precise 10 and 20 kV DC/AC Resistive Divider *774*
Radek Prochazka (Czech Technical University in Prague, Czech Republic)
Jan Hlaváček (Czech Technical University in Prague, Czech Republic)
Karel Draxler (Czech Technical University in Prague, Czech Republic)
Renata Styblíková (Czech Metrology Institute, Czech Republic)

A Method for the Detection of Series Arc Faults in DC Aircraft Power Networks..... *778*
Marco Faifer (Politecnico di Milano, Italy)
Roberto Ottoboni (Politecnico di Milano, Italy)
Marco Rossi (Politecnico di Milano, Italy)
Sergio Toscani (Politecnico di Milano, Italy)
Riccardo Grassetti (Logic SpA, Italy)

PS3D (Poster Session): Advances in Instrumentation and Measurement Developments and Techniques
Room: Pavilion
Chair: *Renata Styblikova (Czech Metrology Institute, Czech Republic)*

Innovation-based Timestamp Validation for Reliable Sensor Network Synchronization *784*
M. Bertocco (University of Padova, Italy)
G. Giorgi (University of Padova, Italy)
C. Narduzzi (University of Padova, Italy)

New Signal Features to Identify Multiple Defects in Structures based on Strain Mode ..... *N/A*
Zhang Dejun (University of Electronic Science and Technology of China, P.R. China)
Yu Yating (Xi'an Jiaotong University, P.R. China)

A Modulation Detector based on Compressive Sensing for Vector Measurement in Cognitive Radio *795*
M. Bertocco (University of Padova, Italy)
G. Frigo (University of Padova, Italy)
G. Giorgi (University of Padova, Italy)
C. Narduzzi (University of Padova, Italy)

Sub-us Synchronization Accuracy in Distributed Measurement System by PDA and PC triggers realignement *801*
F. Lamonaca (University of Calabria, Italy)
D. Grimaldi (University of Calabria, Italy)
R. Morello (University Mediterranea of Reggio Calabria, Italy)

PS3E (Poster Session): Signal and Image Processing Techniques
Room: Pavilion
Chair: *Joseph Case (Missouri University of Science and Technology, USA)*

Comparison of some initialisation methods for the identification of nonlinear state-space models *807*
Anne Van Mulders (Vrije Universiteit Brussel, Belgium)
Laurent Vanbeylen (Vrije Universiteit Brussel, Belgium)

Tracking and Counting Vehicles in Traffic Video Sequences Using Particle Filtering *812*
Christiano Bouvié (Federal University of Rio, Brazil)
Jacob Scharcanski (Federal University of Rio, Brazil)
Pablo Barcellos (Federal University of Rio, Brazil)
Fabiano Lopes Escouto (DIGICON S.A., Brazil)

Thermal image processing for quantitative determination of temperature variations in plantar angiosomes *816*
H. Peregrina-Barreto (Laboratorio de Investigación en Computo Reconfigurable, Mexico)
L. A. Morales-Hernandez (Universidad Autonoma de Queretaro, Mexico)
J. J. Rangel-Magdaleno (Instituto Nacional de Astrofísica, Mexico)
P.D. Vazquez-Rodriguez (Universidad Autonoma de Queretaro, Mexico)

Defect Inspections for SIP Passive Components ..... N/A
Chun-Li Chang (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Wen-Hong Wu (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Chun-Jen Chen (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Wen-Tse Hsiao (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Chih-Yen Chen (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)

Broken Bars Detection on Induction Motor Using MCSA and Mathematical Morphology: An Experimental Study *825*
Jose Rangel-Magdaleno (INAOE, Mexico)
Juan Ramirez-Cortes (INAOE, Mexico)
Hayde Peregrina-Barreto (LICORE, Mexico)

PS3F (Poster Session): Measurement Applications
Room: Pavilion
Chair: *Joseph Case (Missouri University of Science and Technology, USA)*

Infrared Image Sensor for Fire Location ..... N/A
Alessandro Pesatori (Politecnico di Milano, Italy)
Alessandro Magnani (Politecnico di Milano, Italy)
Michele Norgia (Politecnico di Milano, Italy)

3DTV Depth Map Reconstruction Based on Structured Light Scheme *835*
Yu-Cheng Fan (National Taipei University of Technology, Taiwan)
Pin-Kang Huang (National Taipei University of Technology, Taiwan)
De-Wei Shen (National Taipei University of Technology, Taiwan)

The Impact of the Internet of Things on Implanted Medical Devices Including Pacemakers, and ICDs *839*
Joshua R. Stachel (University of Pittsburgh, USA)
Ervin Sejdić (Univerisity of Pittsburgh, USA)
Ajay Ogirala (University of Pittsburgh, USA)
Marlin H. Mickle (University of Pittsburgh, USA)

Universal Environmental Surveillance System with Instrument Cloud Technology *845*
Po Jui Chen (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Chien Hung Chen (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Yu Chieh Chen (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Jung Hsing Wang (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Tai Shan Liao (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Chi Hung Hwang (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)

Extending Industrial Applicability of TDR Liquid Level Monitoring Through Flexible Probes ..... N/A
Andrea Cataldo (University of Salento, Italy)
Giuseppe Cannazza (University of Salento, Italy)
Egidio De Benedetto (University of Salento, Italy)
Emanuele Piuzzi (Sapienza University of Rome, Italy)

PS3G (Poster Session): Real-Time Measurement
Room: Pavilion
Chair: *Mohammad Tayeb Ghasr (Missouri University of Science and Technology, USA)*

MEMS Based Impedimetric Sensing of Phthalates *855*
Asif I. Zia (Massey University, New Zealand)
A.R. Mohd Syaifudin (Massey University, New Zealand)
S.C. Mukhopadhyay (Massey University, New Zealand)
I. H. Al-Bahadly (Massey University, New Zealand)
P.L. Yu (Massey University, New Zealand)
Chinthaka P. Gooneratne (King Abdullah University of Science and Technology, Saudi Arabia)
Jürgen Kosel (King Abdullah University of Science and Technology, Saudi Arabia)
Tai-Shan Liao (Instrument Technology Research Centre, Taiwan)

Evaluation of the Progressive Polynomial Compensation Algorithm for Dynamic or Real-Time Applications ***861***
José Rivera-Mejía (Instituto Tecnologico de Chihuahua, Mexico)
Job E. Villafuerte-Arroyo (Instituto Tecnológico de Chihuahua, Mexico)
Javier Vega-Pineda (Instituto Tecnológico de Chihuahua, Mexico)

Optical Flow Background Subtraction for Real-Time PTZ Camera Object Tracking ***866***
Daniel D. Doyle (Air Force Institute of Technology, USA)
Alan L. Jennings (Air Force Institute of Technology, USA)
Jonathan T. Black (Air Force Institute of Technology, USA)

A Realtime Spatio-temporal watermarking scheme for H.264/AVC ***872***
Mehdi Fallahpour (University of Ottawa, Canada)
Mehdi Semsarzadeh (University of Ottawa, Canada)
Shervin Shirmohammadi (University of Ottawa, Canada)
Jiying Zhao (University of Ottawa, Canada)

PS3H (Poster Session): Non-Invasive Measurement Techniques and Instrumentation
Room: Pavilion
Chair: *Mohammad Tayeb Ghasr (Missouri University of Science and Technology, USA)*

Measurement of Axisymmetric Temperature Distributions Using Single View Fan-beam TDLAS Tomography ***876***
Chang Liu (Beihang University, P.R. China)
Lijun Xu (Beihang University, P.R. China)
Zhang Cao (Beihang University, P.R. China)

Non-invasive PID Control of Peltier Thermal Actuator based on Artificial Neural Network ..... **N/A**
Denis Fabrício Sousa de Sá (Federal University of Maranhão, Brazil)
Joao Viana da Fonseca Neto (Federal University of Maranhão, Brazil)
Marcio Eduardo Gonçalves Silva (Federal University of Maranhão, Brazil)

Analysis of Spectral Signatures of Stator Currents on a Three-Phase Induction Motor Operating in non Stationary Mode for Rotational Speed and Slip Detection Using Rotor Slot Harmonics ***884***
Wilton Lacerda Silva (Federal Institute of Bahia, Brazil)
Amauri Oliveira (Federal Institute of Bahia, Brazil)

09:30 - 11:35
S4A: Measurement, Instrumentation and Methodologies Related to Healthcare Systems
Room: Great Hall
Chair: *Bruce Denby (Université Pierre et Marie Curie, France)*

An Intelligent Ophthalmic Regional Anesthesia Training System based on Capacitive Sensing .. ***889***
Biswarup Mukherjee (Indian Institute of Technology, Madras, India)
Boby George (Indian Institute of Technology Madras, India)
Mohanasankar Sivaprakasam (Indian Institute of Technology, Madras, India)

Digital-to-Time Converter for Fluorescence Lifetime Imaging ***894***
Shuo Li (University of Massachusetts, Amherst, USA)
Christopher Salthouse (University of Massachusetts, Amherst, USA))

A Wireless Sensor Node For Long-Term Monitoring In Life Science Applications ***898***
Peter Passow (Institute of Automation, University of Rostock, Germany)
Norbert Stoll (Center for Life Science Automation, Germany)
Steffen Junginger (Institute of Automation, University of Rostock, Germany)
Kerstin Thurow (Center for Life Science Automation, Germany)

Noise Analysis for Near-Field Intra-body Communication Systems ***902***
Mitsuru Shinagawa (Hosei University, Japan)
Jun Katsuyama (Hosei University, Japan)
Kazuki Matsumoto (Hosei University, Japan)
Shinya Hasegawa (Hosei University, Japan)
Takashi Yanase (Hosei University, Japan)
Ryo Sugiyama (Hosei University, Japan)
Yuichi Kado (Kyoto Institute of Technology, Japan)

144 Channel Measurement IC for CZT Sensors with Energy and Time Resolution ***908***
Matthias Voelker (Fraunhofer IIS, Germany)
Jorge Carrascal (CIEMAT, Spain)
Antonio Soriano-Asensi (I3M, Centro Mixto CSIC-UPV-CIEMAT, Spain)
Jose M. Cela (CIEMAT, Spain)
Filomeno Sánchez (I3M, Centro Mixto CSIC-UPV-CIEMAT, Spain)
Jose M. Perez (CIEMAT, Spain)
Johann Hauer (Fraunhofer Institute for Integrated Circuits, Germany)
Jose M. Benlloch (I3M, Centro Mixto CSIC-UPV-CIEMAT, Spain)

S4B: Measurement of Electric and Magnetic Quantities
Room: Hiawatha 1
Chair: *Mark Yeary (University of Oklahoma, USA)*

Microwave Conductance of Semicontinuous Metallic Films from Coplanar Waveguide Scattering Parameters ***912***
J. Obrzut (National Institute of Standards and Technology, USA)
O. Kirillov (National Institute of Standards and Technology, USA)

Dual-Slope Inductance-to-Digital Converter for Differential Reluctance Sensors ***916***
Noel Philip V. (Indian Institute of Technology, Madras, India)
Boby George (Indian Institute of Technology Madras, India)

A simple ranging system based on mutually coupled resonating circuits ***920***
Marco Dionigi (University of Perugia, Italy)
Guido De Angelis (Regione Umbria, Italy)
Antonio Moschitta (University of Perugia, Italy)
Mauro Mongiardo (University of Perugia, Italy)
Paolo Carbone (University of Perugia, Italy)

Non-Contact Dielectric Characterization of Lithium Ionic Solid Electrolyte Polymer ***925***
Liu Chao (Tufts University, USA)
Mohammed N. Afsar (Tufts University, USA)
Michael A. Zimmerman (Tufts University, USA)
Anil Saigal (Tufts University, USA)

Velocity Induced Eddy Currents Technique to Inspect Cracks in Moving Conducting Media ***931***
H.M. Geirinhas Ramos (Instituto de Telecomunicacoes, Instituto Superior Tecnico, Portugal)
T. Rocha (Instituto de Telecomunicacoes, Instituto Superior Tecnico, Portugal)
Dário Pasadas (Instituto de Telecomunicacoes, Instituto Superior Tecnico, Portugal)
A. Lopes Ribeiro (Instituto de Telecomunicacoes, Instituto Superior Tecnico, Portugal)

S4C: Energy and Power Systems
Room: Hiawatha 2
Chair: *Sara Sulis (University of Cagliari, Italy)*

Impact of heterogeneous measurements in the state estimation of unbalanced distribution networks ***935***
Andrea Angioni (University of Cagliari, Italy)
Carlo Muscas (University of Cagliari, Italy)
Sara Sulis (University of Cagliari, Italy)
Ferdinanda Ponci (RWTH Aachen University, Germany)
Antonello Monti (RWTH Aachen University, Germany)

Traceability of static reactive energy meters in the presence of harmonics: theoretical considerations and a DAQ-based reference meter ..... **N/A**
Antonio Cataliotti (University of Palermo, Italy)
Valentina Cosentino (Università di Palermo, Italy)
Alessandro Lipari (University of Palermo, Italy)
Salvatore Nuccio (University of Palermo, Italy)

Performance of Synchrophasor Measurements Provided by the Weighted Least Squares Approach ***946***
Daniel Belega (University of Timisoara, Romania)
Dario Petri (University of Trento, Italy)

The influence of Void Configuration in Statistical Parameters of Partial Discharge Signals ***952***
Euler C.T. Macedo (Federal University of Paraíba, UFPB, Brazil)
Juan M. Mauricio Villanueva (Federal University of Paraíba, UFPB, Brazil)
Edson C. Guedes (Federal University of Campina Grande, Brazil)
Raimundo C.S. Freire (Federal University of Campina Grande, Brazil)
J.M.R. de Souza Neto (Federal University of Campina Grande, Brazil)
I.A.Glover (University of Huddersfield, United Kingdom)

Error Analysis of Coaxial Shunt under AC Disturbance ..... **N/A**
Chong Zhang (Beihang University, P.R. China)
Jing Wu (Beihang University, P.R. China)
Qishuang Ma (Beihang University, P.R. China)
Haiming Shao (National Institute of Metrology, P.R. China)

S4D: Transducers
Room: Hiawatha 3
Chair: *Damiano Crescini (University of Brescia, Italy)*

A fully integrated three-axis thermal accelerometer ***963***
C.S. Silva (University of Minho, Portugal)
J. Pontes (University of Minho, Portugal)
J.C. Viana (University of Minho, Portugal)
L.A. Rocha (University of Minho, Portugal)
J. Gaspar (INL - International Iberian Nanotechnology Lab)

Low Cost Pressure Mapping Platform for Mobility Monitoring Applications ***967***
S. Cruz (Intitute for Polymers and Composites/I3N, University of Minho, Portugal)
N.J. Vieira (Intitute for Polymers and Composites/I3N, University of Minho, Portugal)
J.C. Viana (Intitute for Polymers and Composites/I3N, University of Minho, Portugal)
L.A. Rocha ((Intitute for Polymers and Composites/I3N, University of Minho, Portugal)

A New Multi-Physics Model of an IP^{2}C Actuator in the Electrical, Chemical, Mechanical and Thermal Domains *971*
R. Caponetto (Università degli Studi di Catania, Italy)
V. De Luca (Università degli Studi di Catania, Italy)
G. Di Pasquale (Università degli Studi di Catania, Italy)
S. Graziani (Università degli Studi di Catania, Italy)
F. Sapuppo (Universita' degli Studi di Catania, Italy)
E. Umana (Università degli Studi di Catania, Italy)

Versatile Measurement System for the Characterization of Gas Sensing Materials *976*
Tommaso Addabbo (University of Siena, Italy)
Francesco Bertocci (University of Siena, Italy)
Ada Fort (University of Siena, Italy)
Marco Mugnaini (University of Siena, Italy)
Valerio Vignoli (University of Siena, Italy)
Luay Shahin (University of Siena, Italy)
Santina Rocchi (University of Siena, Italy)

Thick-film Piezoelectric Based Pressure Sensors for High Impulsive Load ..... N/A
Damiano Crescini (University of Brescia, Italy)

S4E: Measurement of Materials and Mechanical Quantities
Room: Rock Island
Chair: *Paolo Ferrari (University of Brescia, Italy)*

Measurement of intervertebral cervical motion by means of dynamic X-ray image processing and data interpolation ..... N/A
P. Bifulco (University 'Federico II' of Naples, Italy)
M. Cesarelli (University 'Federico II' of Naples, Italy)
M. Romano (University 'Federico II' of Naples, Italy)
A. Fratini (University 'Federico II' of Naples, Italy)
M. Sansone (University 'Federico II' of Naples, Italy)

Integrated measuring approach for the study of corrosion mechanisms *990*
Sabrina Grassini (Politecnico di Torino, Italy)
Marco Parvis (Politecnico di Torino, Italy)
Marie Bouchar (SIS2M LAPA CEA/CNRS UMR3299, France)
Philippe Dillman (SIS2M LAPA CEA/CNRS UMR3299, France)
Delphine Neff (SIS2M LAPA CEA/CNRS UMR3299, France)

Design and Characterization of Curvature Sensors Based on Plastic Optical Fibers for Structural Monitoring..... *996*
A. Vallan (Politecnico di Torino, Italy)
A.Carullo (Politecnico di Torino, Italy)
M. Luisa Casalicchio (Politecnico di Torino, Italy)
G.Perrone (Politecnico di Torino, Italy)

Thermal Analysis of GMAW Process Using Finite Element Method and Experimental data..... *1001*
Javier A. Vargas (Universidad del Norte, Colombia)
Eduardo E. Zurek (Universidad del Norte, Colombia)
Jaime E. Torres (Universidad del Norte, Colombia)
Roque J. Hernandez (Universidad del Norte, Colombia)
Jovanny A. Pacheco (Universidad del Norte, Colombia)

Fast Ultrasonic Imaging for Irregularly Multilayered Objects with Synthetic Aperture Focusing Technique ..... **N/A**
Chun Yang (Tsinghua University, P.R. China)
Kaihuai Qin (Tsinghua University, P.R. China)
Yazhe Li (Tsinghua University, P.R. China)

1:20 - 3:25
S5A: Advances in Instrumentation and Measurement Developments and Techniques
Room: Great Hall
Chair: *Hazem Refai (Oklahoma University, USA)*

Development of a Fiber Bragg Grating Single-Point Temperature Sensor Based on Fixed Filter Demodulation Technique ***1012***
Rodrigo Pereira de Oliveira (Universidade Federal do Rio de Janeiro, Brazil)
Fábio Vieira Batista de Nazaré (Universidade Federal do Rio de Janeiro, Brazil)
Marcelo Martins Werneck (Universidade Federal do Rio de Janeiro, Brazil)

High-resistivity silicon photodiode arrays for x-ray detection ***1017***
Steve Ross (Argonne National Labs, USA)
Michael Haji-Sheikh (Northern Illinois University, USA)
Gregg Westberg (Northern Illinois University, USA)

Creating an Automated and Emulated 802.11g Wireless Interfering Network for Wireless Coexistence Testing ***1022***
Nickolas J. LaSorte (University of Oklahoma-Tulsa, USA)
Dan Bloom (University of Oklahoma - Tulsa, USA)
Samer Rajab (University of Oklahoma-Tulsa, USA)
Hazem H. Refai (University of Oklahoma-Tulsa, USA)

The evaluation of uncertainty contributions due to uncompensated systematic effects ***1028***
Alessandro M. Ferrero (Politecnico di Milano, Italy)
Marco Prioli (Politecnico di Milano, Italy)
Simona Salicone (Politecnico di Milano, Italy)

Development of Economic Incentives For Harmonic and Asymmetry Reduction Based on the Concept of Working Power ***1034***
Tracy N. Toups (Louisiana State University, USA)
Leszek S. Czarencki (Louisiana State University, USA)

S5B: Signal and Image Processing Techniques
Room: Hiawatha 1
Chair: *Serge Demidenko (RMIT International University Vietnam & Saigon South campus, Vietnam)*

Using the ADTree for Feature Reduction through Knowledge Discovery ***1040***
Hong Kuan Sok (Monash University Sunway Campus, Malaysia)
Mohammed Shahnewaz Chowdhury (Monash University Sunway Campus, Malaysia)
Melanie Po-Leen Ooi (Monash University Sunway Campus, Malaysia)
Ye Chow Kuang (Monash University Sunway Campus, Malaysia)
Serge Demidenko (RMIT International University, Vietnam)

An Optimization-Based Ensemble EMD for Classification of Hyperspectral Images *1045*
Yi Shen (Harbin Institute of Technology, P.R. China)
Zhi He (Harbin Institute of Technology, P.R. China)
Xiaoshuai Li (Harbin Institute of Technology, P.R. China)
Qiang Wang (Harbin Institute of Technology, P.R. China)
Miao Zhang (Harbin Institute of Technology, P.R. China)
Yan Wang (Harbin Institute of Technology, P.R. China)

Measurement Matrix Construction Algorithm for Sparse Signal Recovery *1051*
Wenjie Yan (Harbin Institute of Technology, P.R. China)
Qiang Wang (Harbin Institute of Technology, P.R. China)
Yi Shen (Harbin Institute of Technology, P.R. China)
ZhengHua Wu (Harbin Institute of Technology, P.R. China)

The Application of Wavelet Transform in Crater Detection *1057*
Xiaoyu Li (Harbin Institute of Technology, P.R. China)
Yi Shen (Harbin Institute of Technology, P.R. China)
Yang Tian (Harbin Institute of Technology, P.R. China)
Qiang Wang (Harbin Institute of Technology, P.R. China)

Morphological Detectors for Radar ELINT Applications *1062*
J.F. Rivest (Defense R&D Canada, Canada)
S. Rajan (Defense R&D Canada, Canada)

1:20 - 3:25
SS2 (Part 3): Emerging Methods for Measuring, Modeling, and Instrumentation in Medical Applications
Room: Hiawatha 3
Chairs: *Kurt Barbé (VUB, Belgium), Wendy Van Moer (Vrije Universiteit Brussel, Belgium)*

Design methodology of a self-priming PMMA valveless piezoelectric micro-pump *1068*
A.G.S. Barreto Neto (Universidade Federal de Campina Grande & Instituto Federal da Paraiba, Brazil)
A.M.N. Lima (Universidade Federal de Campina Grande, Brazil)
C.L. Gomes (Universidade Federal de Campina Grande, Brazil)
L.C. Oliveira (Universidade Federal de Campina Grande, Brazil)
C.S. Moreira (Instituto Federal de Alagoas, Brazil)
F.A.F. Tejo (Universidade Federal de Campina Grande, Brazil)

An Instrumentation System based on Magnetoresistive Sensors For Neuronal Signal Detection *1074*
Tiago Costa (Instituto Superior Técnico & INESC-ID, Portugal)
Moisés S. Piedade (Instituto Superior Técnico, Portugal)
José Germano (INESC-ID, Portugal)
José Amaral (Instituto Superior Técnico, Portugal)
Paulo P. Freitas (INESC-MN, Portugal)

A Thermal Energy Balance Model for Hypotension Prevention in Hemodialysis *1078*
Rosario Morello (University Mediterranea of Reggio Calabria, Italy)
Claudio De Capua (University Mediterranea of Reggio Calabria, Italy)
Laura Fabbiano (Polytechnic of Bari, Italy)
Gaetano Vacca (Politecnico di Bari, Italy)

Semi-automated Detection of Single Cell Signatures from a Dielectrophoretic Cytometer *1083*
Bahareh Saboktakin Rizi (University of Manitoba, Canada)
Ashlesha Bhide (University of Manitoba, Canada)
Tim Cabel (University of Manitoba, Canada)
Marija Nikolic-Jaric (University of Manitoba, Canada)
Elham Salimi (University of Manitoba, Canada)
Katrin Braasch (University of Manitoba, Canada)
Michael Butler (University of Manitoba, Canada)
Greg E. Bridges (University of Manitoba, Canada)
Douglas J. Thomson (University of Manitoba, Canada)

Characterization of Ultra-Thin Silicon Strip Detectors for Hadrontherapy Beam Monitoring *1088*
Mohamed Bouterfa (Université Catholique de Louvain, Belgium)
Khaled Aouadi (Université Catholique de Louvain, Belgium)
Denis Flandre (Université catholique de Louvain, Belgium)
Eduardo Cortina Gil (Université Catholique de Louvain, Belgium)

SS3 (Part 3): Instrumentation and Measurement for Improving Quality, Reliability and Safety
Room: Rock Island
Chair: *Marcantonio Catelani (University of Florence, Italy)*

A fine time-resolution (< 3 ps-rms) Time-to-Digital Converter for Highly Integrated Designs..... *1092*
Lukas Perktold (Graz University of Technology, Austria)
Jorgen Christiansen (CERN, Switzerland)

Face based recognition algorithms: the use of the uncertainty in the classification..... *1098*
Giovanni Betta (University of Cassino, Italy)
Domenico Capriglione (University of Cassino, Italy)
Mariella Corvino (University of Cassino, Italy)
Consolatina Liguori (University of Salerno, Italy)
Alfredo Paolillo (University of Salerno, Italy)

Architecture and Performance of an Instrumented RF System that Utilizes the GNSS Satellite Network *1104*
C. Davis (University of Oklahoma, USA)
R. Pendergraft (University of Oklahoma, USA)
J. Henderson (University of Oklahoma, USA)
J. Dyer (University of Oklahoma, USA)
M. Yeary (University of Oklahoma, USA)
J. Fagan (University of Oklahoma, USA)

Software Instrumentation for Failure Analysis of USB Host Controllers..... *1109*
Antonio Sabatini (Missouri University of Science and Technology, USA)
Nathan Jarus (Missouri University of Science and Technology, USA)
Pratik Maheshwari (Missouri University of Science and Technology, USA)
Sahra Sedigh (Missouri University of Science and Technology, USA)

Efficient Concurrent BIST with Comparator-based Response Analyzer *1115*
Yang Yu (Harbin Institute of Technology, P.R. China)
Zhiming Yang (Harbin Institute of Technology, P.R. China)
Xiyuan Peng (Harbin Institute of Technology, P.R. China)
Dianguo Xu (Harbin Institute of Technology, P.R. China)

2:10 - 3:25
SS4 (Part 1): Wireless Sensors Networks for Assisted Living
Room: Hiawatha 2
Chairs: *Bruno Andò (University of catania, Italy), Salvatore Baglio (University of Catania, Italy)*

Energy-Efficient and Data Synchronized Body Sensor Network for Physical Activity Measurement ***1120***
Lingfei Mo (Southeast University, P.R. China)
Shaopeng Liu (GE Global Research, USA)
Robert X. Gao (University of Connecticut, USA)
Patty S. Freedson (University of Massachusetts Amherst, USA)

Practical Indoor Localization using Ambient RF ***1125***
Ye Tian (Université Pierre et Marie Curie, France)
Bruce Denby (Université Pierre et Marie Curie, France)
Iness Ahriz (Conservatoire National des Arts et Métiers, France)
Pierre Roussel (SIGMA Lab, ESPCI ParisTech, France)
Remi Dubois (SIGMA Lab, ESPCI ParisTech, France)
Gerard Dreyfus (SIGMA Lab, ESPCI ParisTech, France)

3:25 - 6:00
PS4A (Poster Session): Measurement Applications
Room: Pavilion
Chair: *Luca De Vito (University of Sannio, Italy)*

Instrument for Measurement of Optical Parameters of Turbid Media by Using Diffuse Reflectance of Laser With Oblique Incidence Angle ***1130***
Harri J. Juttula (University of Oulu, Finland)
Timo P. Kananen (University of Oulu, Finland)
Anssi J. Mäkynen (University of Oulu, Finland)

Multichannel Acquisition System and Denoising for the Detection and Location of Partial Discharges using Acoustic Emissions ***1135***
Iago Búa Núñez (Universidad Carlos III de Madrid, Spain)
Julio E. Posada Román (Universidad Carlos III de Madrid, Spain)
Jesús Rubio Serrano (Universidad Carlos III de Madrid, Spain)
José A. Garcia-Souto (Universidad Carlos III de Madrid, Spain)

Jitter and its relatives: a critical overview ***1141***
E. Balestrieri (University of Sannio, Italy)
P. Daponte (University of Sannio, Italy)
L. De Vito (University of Sannio, Italy)
S. Rapuano (University of Sannio, Italy)

Multi-input identification of IP2C actuators ***1147***
Graziani S. (University of Catania, Italy)
Umana E. (University of Catania, Italy)
Xibilia M.G. (University of Messina, Italy)
De Luca V. (Università degli Studi di Catania, Italy)

Omnidirectional Image of Fish-eye Lens for Contact Lens Inspection System ***1152***
Yung-Hsiang Chen (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Chun-Li Chang (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Chi-Hung Hwang (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Wei-Chung Wang (National Tsing Hua University, Taiwan)

PS4B (Poster Session): Energy and Power Systems
Room: Pavilion
Chair: *Luca De Vito (University of Sannio, Italy)*

A Novel Measurement Technique for Performance Comparison of Sun Tracker Systems *1156*
Jeevan Doss C.R. (IIT Madras, India)
Kumaravel M (IIT Madras, India)
Boby George (IIT Madras, India)
Jagadeesh Kumar V (IIT Madras, India)

Low Voltage DC Power Supply With Spike-blocking Features *1161*
A. Lutfi Torla (International Islamic University, Malaysia)
Sheroz Khan (International Islamic University, Malaysia)
Asan Ghani Muthalif (International Islamic University, Malaysia)
Amelia Wong Azman (International Islamic University, Malaysia)
Yasir Mohd Mustafah (International Islamic University, Malaysia)

Wireless System for Detecting High Intensity Current Impulses Applied to Ground Grids *1165*
M.S. de Castro (Federal University of Campina Grande, UFCG, Brazil)
R.C.S. Freire (Federal University of Campina Grande, UFCG, Brazil)
E.G. Costa (Federal University of Campina Grande, UFCG, Brazil)
N.S.S. da Fonsêca (Federal University of Campina Grande, UFCG, Brazil)
M.A.O. Rodrigues (Federal University of Campina Grande, UFCG, Brazil)
E.C.T. de Macedo (Federal University of Paraíba, Brazil)
J.M.M. Villanueva (Federal University of Paraíba, Brazil)

Characterization of microgrid smart metering: phasor estimation under impaired conditions... *1170*
Matteo Bertocco (University of Padova, Italy)
Claudio Narduzzi (University of Padova, Italy)
Federico Tramarin (National Research Council (CNR) of Italy, Italy)

On the Performance of Consensus Protocols for Decentralized Smart Grid Metering in Presence of Measurement Uncertainty..... *1176*
Domenico Capriglione (University of Cassino, Italy)
Luigi Ferrigno (University of Cassino, Italy)
Vincenzo Paciello (University of Salerno, Italy)
Antonio Pietrosanto (University of Salerno, Italy)
Alfredo Vaccaro (University of Sannio, Italy)

PS4C (Poster Session): Measurement and Instrumentation for Industrial Applications
Room: Pavilion
Chair: *Juan Moises Mauricio Villanueva (Universidade Federal da Paraíba, Brazil)*

Wind Speed Measurement based on Time-of-Flight Estimation using Extended Kalman Filter.. *1182*
Juan M. Mauricio Villanueva (Federal University of Paraiba-UFPB, Brazil)
Sebastian Y.C. Catunda (Federal University of Rio Grande do Norte, Brazil)
Raimundo Carlos S. Freire (Federal University of Campina Grande–UFCG, Brazil)
Maxwell M. Costa (Federal Federal Institute of Tocantins–IFTO, Brazil)
Nestor S. Castro Ingaroca (National University of Engineering-UNI, Peru)

Analysis of Synchronization Performance in Redundant Networks for Substation Automation. *1188*
P. Ferrari (University of Brescia, Italy)
A. Flammini (University of Brescia, Italy)
S. Rinaldi (University of Brescia, Italy)
G. Prytz (ABB Corporate Research, Norway)

Rail defect detection based on vibration acceleration signals ***1194***
Qiang Wei (Harbin Institute of Technology, P.R. China)
Xin Zhang (Harbin Institute of Technology, P.R. China)
Yan Wang (Harbin Institute of Technology, P.R. China)
Naizhang Feng (Harbin Institute of Technology, P.R. China)
Yi Shen (Harbin Institute of Technology, P.R. China)

The Development of Yellow Ring Measurement System for White LED ..... ***N/A***
Ching-Ching Yang (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Kuo-Cheng Huang (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Hsin-Yi Tsai (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Wen-Tse Hsiao (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)

Non-contact Modeling of Current Tracing Probe..... ***N/A***
Chien-Hung Chen (National Applied Research Laboratories, Instrument Technology Research Center, Taiwan)
Eric Hsiang-Yu Tu (University of California, Davis, USA)
Kuo-Cheng Huang (National Applied Research Laboratories, Instrument Technology Research Center, Taiwan)
Yuh-Shyong Yang (National Chiao Tung University, Taiwan)
Tai-Shan Liao (National Applied Research Laboratories, Instrument Technology Research Center, Taiwan)

PS4D (Poster Session): Sensors and Sensor Fusion
Room: Pavilion
Chair: *Juan Moises Mauricio Villanueva (Universidade Federal da Paraíba, Brazil)*

A Multisensor Fusion Architecture for Two Phase Flow Process Parameters Measurement ..... ***N/A***
Chao Tan (Tianjin University, P.R. China)
Yan Zhou (Tianjin University, P.R. China)
Feng Dong (Tianjin University, P.R. China)

All-Optical Differential Current Detection Technique for Unit Protection Applications ***1214***
Grzegorz Fusiek (University of Strathclyde, United Kingdom)
Philip Orr (University of Strathclyde, United Kingdom)
Hao Wang (University of Strathclyde, United Kingdom)
Pawel Niewczas (University of Strathclyde, United Kingdom)

Time-Variant Electrical Equivalent Circuit of a Dry Bacteriorhodopsin Sensor..... ***1218***
Joonas P. Talvitie (Lappeenranta University of Technology, Finland)
Teemu Tukiainen (Lappeenranta University of Technology, Finland)
Lasse Lensu (Lappeenranta University of Technology, Finland)
Tommi J. Kärkkäinen (Lappeenranta University of Technology, Finland)
Pertti Silventoinen (Lappeenranta University of Technology, Finland)
Mikko Kuisma (Lappeenranta University of Technology, Finland)

PS4E (Poster Session): Signal and Image Processing Techniques
Room: Pavilion
Chair: *Marian Kampik (Politechnika Slaska, Poland)*

A Digital Calibration Technique for Cyclic ADCs Using MOS Capacitors ***1222***
Zhiheng Wei (Shizuoka University, Japan)
Shoji Kawahito (Shizuoka University, Japan)

Modified phase-only correlator for pileup correction for gamma-ray spectrometry ***1227***
Neda Nabavi (University of Ottawa, Canada)
Miodrag Bolic (University of Ottawa, Canada)

Minimum bias error of the frequency estimation with the non-parametric method ***1232***
Tomaž Lušin (Metrel d. d., Slovenia)
Dušan Agrež (University of Ljubljana, Slovenia)

Compressive Blind Mixing Matrix Recovery Algorithm Based on Gradient Ascent..... ***1238***
Ning Fu (Harbin Institute of Technology, P.R. China)
Wei Yu (Harbin Institute of Technology, P.R. China)
Li-yan Qiao (Harbin Institute of Technology, P.R. China)
Ying Liu (Beijing Aerospace Automatic Control Institute, P.R. China)
Gang Wang (Harbin Institute of Technology, P.R. China)

Laser spot center location by using the gradient-based and least square algorithms..... ***1242***
Lei Xin (Beihang University, P.R. China)
Lijun Xu (Beihang University, P.R. China)
Zhang Cao (Beihang University, P.R. China)

PS4F (Poster Session): Measurement of Electric and Magnetic Quantities
Room: Pavilion
Chair: *Marian Kampik (Politechnika Slaska, Poland)*

Measurement Technique to Characterize After-Effect in Soft Magnetic Materials ***1246***
Roberto Ferrero (University of Pisa, Italy)
Mirko Marracci (University of Pisa, Italy)
Bernardo Tellini (University of Pisa, Italy)

Series arc faults in AC and DC electrical circuits. Characterization and detection methods..... **N/A**
Giovanni Artale (Università di Palermo, Italy)
Antonio Cataliotti (Università di Palermo, Italy)
Valentina Cosentino (Università di Palermo, Italy)
Giuseppe Privitera (STMicroelectronics, Italy)

Low Intrusive Efficiency Estimative of DC Motors ***1255***
V.J. Brusamarello (Universidade Federal do Rio Grande do Sul, Brazil)
I. Müller (Universidade Federal do Rio Grande do Sul, Brazil)
A.Silva (Universidade Federal do Rio Grande do Sul, Brazil)
J. Klein (Universidade Luterana do Brasil, Brazil)

Measurement Technique for Characterizing Constitutive Material Properties of Thin Films..... ***1261***
Anjali Sharma (Tufts University, USA)
Mohammed N. Afsar (Tufts University, USA)

A Novel Monitoring Method for Condensive Bushings ***1266***
Marcos P. Botelho (Universidade Federal do Rio de Janeiro, Brazil)
Tiago B. Gomes (Universidade Federal do Rio de Janeiro, Brazil)
Fábio V. B. de Nazaré (Universidade Federal do Rio de Janeiro, Brazil)
José L.S. Neto (Universidade Federal do Rio de Janeiro, Brazil)
Marcelo M. Werneck (Universidade Federal do Rio de Janeiro, Brazil)
Raimundo N. Rosa Filho (Eletronorte-Eletrobras, Brazil)

3:55 - 6:00
S6A: Measurement Systems and Theory
Room: Great Hall
Chair: *Rik Pintelon (Vrije Universiteit Brussel, Belgium)*

Vibration Characteristic HHT Analyze and Switching Synchronism Research for Low Voltage Circuit Breaker ..... **N/A**
Xi-ren Miao (Fuzhou University, P.R. China)

Obtaining Higher-Order Derivatives of Low-Frequency Signals Using Multirate Signal Processing ***1277***
Li Tan (Purdue University North Central, USA)
Jean Jiang (Purdue University North Central, USA)
Liangmo Wang (Nanjing University of Science and Technology, P.R. China)

A Multifunctional Self-validating sensor ***1283***
Qi Wang (Harbin Institute of Technology, P.R. China)
Zhengguang Shen (Harbin Institute of Technology, P.R. China)
Fengyu Zhu (Harbin Institute of Technology, P.R. China)

FRF Measurements on Slowly Time-Varying Systems Using Multisines with Non-Uniformly Spaced Harmonics ***1289***
R. Pintelon (Vrije Universiteit Brussel, Belgium)
E. Louarroudi (Vrije Universiteit Brussel, Belgium)
J. Lataire (Vrije Universiteit Brussel, Belgium)

Eliminating User-Interaction in Probability Density Estimation ***1295***
Kurt Barbé (Vrije Universiteit Brussel, Belgium)
Lee Gonz ales Fuentes (Vrije Universiteit Brussel, Belgium)
Lee Barford (Measurement Research Laboratory, Agilent Technologies, USA)
Wendy Van Moer (Vrije Universiteit Brussel, Belgium)

SS5: Technology Transfer and Expert Panel Discussion
Room: Hiawatha 1
Chair: *Reza Zoughi (Missouri University of Science and Technoogy, USA)*

3:55 - 5:10
SS4 (Part 2): Wireless Sensors Networks for Assisted Living
Room: Hiawatha 2
Chairs: *Bruno Andò (University of catania, Italy), Salvatore Baglio (University of Catania, Italy)*

Instrumentation for safe vehicular flow in intelligent traffic control systems using wireless networks ***1301***
Halit Eren (Curtin University of Technology, Australia)
Hariani Ma'tang Pakka (Curtin University, Australia)
Ahmed S. AlGhamdi (Curtin University, Australia)

Design of a Smart Indoor Air Quality Monitoring Wireless Sensor Network for Assisted Living ***1306***
D.M.G. Preethichandra (Central Queensland University, Australia)

Multiple Nonlinear Oscillators for Autonomous Wireless Sensor Nodes ***1311***
B. Andò (University of Catania, Italy)
S. Baglio (University of Catania, Italy)
F. Maiorca (University of Catania, Italy)
C.Trigona (University of Catania, Italy)

3:55 - 6:00
SS2 (Part 4): Emerging Methods for Measuring, Modeling, and Instr umentation in Medical Applications
Room: Hiawatha 3
Chair: *Wendy Van Moer (Vrije Universiteit Brussel, Belgium)*

CMOS Instrumentation System For Matrix-Based Magnetoresistive Biosensors ***1315***
Tiago Costa (INESC-ID, Portugal)
Moisés S. Piedade (INESC-ID, Portugal)
Filipe A.Cardoso (INESC-MN, Portugal)
Paulo P. Freitas (INESC-MN, Portugal)

Contactless detection of pacemaker pulses by measuring the associated magnetic field ***1319***
P. Bifulco (University Federico II of Naples, Italy)
M. Cesarelli (University Federico II of Naples, Italy)
M. Romano (University Federico II of Naples, Italy)
G.D. Gargiulo (The University of Sydney, Australia)
A. Liccardo (University Federico II of Naples, Italy)
M. Polisiero (University Federico II of Naples, Italy)
M. D'Apuzzo (University Federico II of Naples, Italy)

Diagnosis of Gastric Disorders by Non-invasive Myoelectrical Measurements ***1324***
Rosario Morello (University Mediterranea of Reggio Calabria, Italy)
Claudio De Capua (University Mediterranea of Reggio Calabria, Italy)
Francesco Lamonaca (University of Calabria, Italy)

Optimization for temperature estimation using magnetic nanoparticle: a set of equations solving solution investigation ***1329***
Jing Zhong (Huazhong University of Science and Technology, P.R. China)
Wenzhong Liu (Huazhong University of Science and Technology, P.R. China)
Shiqiang Pi (Huazhong University of Science and Technology, P.R. China)
Pu Zhang (Huazhong University of Science and Technology, P.R. China)

New Semantic Web rules and new medical reasoning framework ***1332***
Nassim Douali (Pierre and Marie Currie University, France)
Jos De Roo (Agfa HealthCare, Belgium)
Jean Marc Vanel (Deduction Sarl, France)
Marie-Christine Jaulent (Pierre and Marie Currie University, France)

SS3 (Part 4): Instrumentation and Measurement for Improving Quality, Reliability and Safety
Room: Rock Island
Chair: *Marcantonio Catelani (University of Florence, Italy)*

Real-Time Processing of Multi-Frequency Eddy Currents Testing Signals ***1336***
Luis S. Rosado (Instituto Superior Técnico, Universidade Técnica de Lisboa, Portugal)
Tiago Catarrunas (Instituto Superior Técnico, Universidade Técnica de Lisboa, Portugal)
Moisés Piedade (Instituto Superior Técnico, Universidade Técnica de Lisboa, Portugal)
Pedro M. Ramos (Instituto Superior Técnico, Universidade Técnica de Lisboa, Portugal)

A Kalman filter based method for locating and georeferencing car accidents ..... N/A
Leopoldo Angrisani (Università degli Studi di Napoli Federico II, Italy)
Antonio Iodice (Università degli Studi di Napoli Federico II, Italy)
Nicola Pasquino (Università degli Studi di Napoli Federico II, Italy)
Rosario Schiano Lo Moriello (Università degli Studi di Napoli Federico II, Italy)

Hydrogen Sensing using Impedance Measurements of Nanocrystalline Palladium *1347*
Martin Kocanda (Northern Illinois University, USA)
Michael Haji-Sheikh (Northern Illinois University, USA)
Christina Johnson (Northern Illinois University, USA)
Edward King (Northern Illinois University, USA)
David S. Ballantine (Northern Illinois University, USA)
A.R. Syaifudin (Malaysian Agricultural Research & Development Institute, Malaysia)
S.C. Mukhopadhyay (Massey University, New Zealand)

Vibration Frequency Peak Detection and Sorting Technique for Passenger Vehicles *1353*
M. Santacruz (Universidad Autonoma de Baja California & Universidad Estatal de Sonora, Mexico)
M. Félix (Universidad Autónoma de Baja California, Mexico)
J. Ocampo (Universidad Autónoma de Baja California, Mexico)
G.Luna (Universidad Estatal de Sonora, Mexico)

An Improved Printed Balun For A Dual Device Load Board *1358*
Claudio M. Montiel (Texas A&M University at Kingsville, USA)

Thursday, May 9

08:00 - 10:05
S7A: Measurement Applications
Room: Great Hall
Chair: *Subhas Mukhopadhyay (Massey University, New Zealand)*

A Reluctance-Hall Effect based Linear Digital Angle Sensor *1362*
C.S. Anoop (Indian Institute of Technology Madras, India)
Boby George (Indian Institute of Technology Madras, India)

Selective Measurement of Volcanic Ash Flow-Rate *1367*
B.Andò (University of Catania, Italy)
S.Baglio (University of Catania, Italy)
V. Marletta (University of Catania, Italy)

A Simple Analog Front-End Circuit for Grounded Capacitive Sensors with Offset Capacitance *1372*
Cyril Baby K (Indian Institute of Technology Madras, India)
Boby George (Indian Institute of Technology Madras, India)

Ubiquitous Motion Sensing Service Using Wearable Shoe Module and Mobile Device *1376*
Ying-Xun Lai (National Cheng Kung University, Taiwan)
Yi-Wei Ma (National Cheng Kung University, Taiwan)
Yueh-Min Huang (National Cheng Kung University, Taiwan)
Jiann-Liang Chen (National Taiwan University of Science and Technology, Taiwan)
Subhas Chandra Mukhopadhyay (Massey University, New Zealand)

Dynamic Neuro-fuzzy Estimation of the Weld Penetration in GTAW Process *1380*
YuKang Liu (University of Kentucky, USA)
WeiJie Zhang (University of Kentucky, USA)
YuMing Zhang (University of Kentucky, USA)

S7B: Robotics and Controls
Room: Hiawatha 1
Chair: *Semih Aslan (Texas State University, USA)*

Visual UAV Control System Using LED Panel and On-board Camera ***1386***
Hiroyuki Ukida (The University of Tokushima, Japan)
Masafumi Miwa (The University of Tokushima, Japan)
Yoshio Tanimoto (Kibikogen Rehabilitation Center, Japan)
Tetsuya Sano (System Enterprise Co., Ltd, Japan)
Hideki Yamamoto (Kibikogen Rehabilitation Center, Japan)

A Miniature, Low-cost MEMS AHRS with Application to Posture Control of Robotic Fish ***1392***
Yonghui Hu (North China Electric Power University, P.R. China)
Yong Yan (University of Kent, United Kingdom)
Jianhong Liang (Beihang University, P.R. China)
Lijuan Wang (North China Electric Power University, P.R. China)

Sparse-grid Quadrature Kalman Filter based on the Kronrod-Patterson Rule ***1396***
Cheng Xianghong (Southeast University, P.R. China)
Ran Changyan (Southeast University, P.R. China)
Wang Haipeng (Southeast University, P.R. China)

Image-Based Floor Segmentation in Visual Inertial Navigation..... ***1402***
Guillem Casas Barceló (KTH Royal Institute of Technology, Sweden)
Ghazaleh Panahandeh (KTH Royal Institute of Technology, Sweden)
Magnus Jansson (KTH Royal Institute of Technology, Sweden)

Design Flow for Complex Scene Visual Object Tracking and Avoidance System ***1408***
Thomas Gonnot (Illinois Institute of Technology, USA)
Jafar Saniie (Illinois Institute of Technology, USA)

S7C: Advances in Instrumentation and Measurement Developments and Techniques
Room: Hiawatha 2
Chair**:** *Voicu Groza (University of Ottawa, Canada)*

The Forthcoming IEEE Standard 1696 on Test Methods for Characterizing Circuit Probes ***1412***
Nicholas G. Paulter, Jr. (National Institute of Standards and Technology, USA)
Mike McTigue (Agilent Technologies, USA)
Bill Hagerup (Tektronix, USA)
Thomas Linnenbrink (Hittite Microwave Corp., USA)

Uncertainty Analysis Of Three-Dimensional Three-Component (3C3D) Microflow Imaging and Velocity Measurement System Using Monte-Carlo Simulation ***1416***
Mona Abdolrazaghi (University of Alberta, Canada)

Numerical Model for Predicting and Managing Heat Dissipation from a Neural Probe ***1420***
Matthew P. Christian (United States Naval Academy, USA)
Andrew N. Smith (United States Naval Academy, USA)
Samara L. Firebaugh (United States Naval Academy, USA)

Parasitic Effect - Independent Approach for Dissipation Factor Measurement in Power Transformers ***1426***
Lorenzo Peretto (University of Bologna, Italy)
Roberto Tinarelli (University of Bologna, Italy)
Mauro Puricelli (ISA s.r.l., Italy)

New Method of the Precise Propagation Delay Measurement ***1431***
Yi-Jiun Huang (Telecommunication Laboratories, Chunghwa Telecom Co., Ltd., Taiwan)
Huang-Tien Lin (Telecommunication Laboratories, Chunghwa Telecom Co., Ltd., Taiwan)
Chia-Shu Liao (Telecommunication Laboratories, Chunghwa Telecom Co., Ltd., Taiwan)
Wen-Hung Tseng (Telecommunication Laboratories, Chunghwa Telecom Co., Ltd., Taiwan)
Jia-Lun Wang (Telecommunication Laboratories, Chunghwa Telecom Co., Ltd., Taiwan)
Fang-dar Chu (Telecommunication Laboratories, Chunghwa Telecom Co., Ltd., Taiwan)

08:50 - 10:05
SS6 (Part 1): RF/Microwave Materials and Characterization
Room: Hiawatha 3
Chair: *Samir Trabelsi (USDA, USA)*

Finite Flange Correction for Microwave and Millimeter-Wave Nondestructive Material Characterization ***1435***
Matthew Kempin (Missouri University of Science and Technology, USA)
Mohammad Tayeb Ghasr (Missouri University of Science and Technology, USA)
Reza Zoughi (Missouri University of Science and Technoogy, USA)

In Vivo Microwave Dielectric Spectroscopy of Breast Tumor Xenografts with Intra-Tumoral Injections of SWCNT Dispersions ***1441***
Fuqiang Gao (University of Wisconsin-Madison, USA)
Susan C. Hagness (University of Wisconsin, Madison, USA)
John H. Booske (University of Wisconsin-Madison, USA)
Shawn X. Xie (Stony Brook University, USA)
Balaji Sitharaman (Stony Brook University, USA)

A Calibration Technique for Measuring the Complex Permittivity of Materials with Planar Transmission Lines ***1445***
Jochem Roelvink (United States Department of Agriculture, USA)
Samir Trabelsi (United States Department of Agriculture, USA)

SS7 (Part 1): Advanced Measurement and Data Processing for Engineering System Health Monitoring
Room: Rock Island
Chair: *Ruqiang Yan (Southeast University, P.R. China)*

Acoustic-Based Wireless Data Transmission for Process Monitoring ***1449***
Z. Fan (University of Connecticut, USA)
R.X. Gao (University of Connecticut, USA)
D.O. Kazmer (University of Massachusetts, Lowell, USA)

Pseudo Non-dyadic Second Generation Wavelet Tight Frame for Machine Fault Diagnosis..... ***1453***
Binqiang Chen (Xi'an Jiaotong University, P.R. China)
Zhousuo Zhang (Xi'an Jiaotong University, P.R. China)
Jie Zhang (Xi'an Jiaotong University, P.R. China)
Zhibo Yang (Xi'an Jiaotong University, P.R. China)
Zhengjia He (Xi'an Jiaotong University, P.R. China)

An Improved Independent Component Analysis by Reference Signals and Its Application on Source Contribution Estimation *1459*
Jie Zhang (Xi'an Jiaotong University, P.R. China)
Zhousuo Zhang (Xi'an Jiaotong University, P.R. China)
Binqiang Chen (Xi'an Jiaotong University, P.R. China)
Wei Cheng (Xi'an Jiaotong University, P.R. China)
Zhibo Yang (Xi'an Jiaotong University, P.R. China)
Zhengjia He (Xi'an Jiaotong University, P.R. China)

10:05 - 12:40
PS5A (Poster Session): Biomedical Systems
Room: Pavilion
Chair: *Sergey Kharkovsky (University of Western Sydney & UWS, Australia)*

Measurement of Driving Routes and Correlation to Optimal Navigation Paths *1465*
Bruce Wallace (Carleton University, Canada)
Rafik Goubran (Carleton University, Canada)
Frank Knoefel (Bruyère Research Institute & University of Ottawa & Carleton University, Canada)

Cognitive Stress Recognition *1471*
Taylor K. Calibo (United States Naval Academy, USA)
Justin A.Blanco (United States Naval Academy, USA)
Samara L. Firebaugh (United States Naval Academy, USA)

Sensitivity of an optical sensor that operates at angular or wavelength interrogation mode *1476*
L.C. Oliveira (UFCG, Campina Grande, Brazil)
T.A.T. de Sousa (UFCG, Campina Grande, Brazil)
F.C.C. Loureiro (UFCG, Campina Grande, Brazil)
E.U.K. Melcher (UFCG, Campina Grande & Northeast Center for Strategic Technologies, Recife, Brazil)
A.M.N. Lima (UFCG, Campina Grande, Brazil)
H.Neff (UFCG, Campina Grande & Northeast Center for Strategic Technologies, Recife, Brazil)

Transmission Reliability of Implantable Wireless Temperature Loggers for Laboratory Rats *1482*
Ásgeir Bjarnason (Tampere University of Technology & Star-Oddi Ltd., Finland)
Hákon Guðmundsson (Star-Oddi Ltd., Iceland)
Sigurður Gunnlaugsson (Star-Oddi Ltd., Iceland)
Andrés Gunnarsson (Star-Oddi Ltd., Iceland)
Kjaran Sveinsson (Star-Oddi Ltd., Iceland)
Sigmar Guðbjörnsson (Star-Oddi Ltd., Iceland)

PS5B (Poster Session): Non-Invasive Measurement Techniques and Instrumentation
Room: Pavilion
Chair: *Sergey Kharkovsky (University of Western Sydney & UWS, Australia)*

Detecting the Presence of Large Biomass Particles in Pneumatic Conveying Pipelines Using an Acoustic Sensor *1487*
Duo Sun (University of Kent, United Kingdom)
Yong Yan (University of Kent, United Kingdom)
Robert M. Carter (University of Kent, United Kingdom)
Gang Lu (University of Kent, United Kingdom)
Gerry Riley (RWE npower, United Kingdom)
Matthew Wood (RWE npower, United Kingdom)

Illumination Design in Vision-based Measurement Systems ***1491***
Giuseppe Di Leo (University of Salerno, Italy)
Consolatina Liguori (University of Salerno, Italy)
Antonio Pietrosanto (University of Salerno, Italy)
Vincenzo Paciello (University of Salerno, Italy)
Alfredo Paolillo (University of Salerno, Italy)

Analysis of Different Coating Thickness on New Type of Planar Interdigital Sensors for Endotoxin Detection ***1496***
A.R. Mohd Syaifudin (Massey University, New Zealand)
P.L.Yu (Massey University, New Zealand)
S.C. Mukhopadhyay (Massey University, New Zealand)
C.P.Gooneratne (King Abdullah University of Science and Technology, Saudi Arabia)
J. Kosel (King Abdullah University of Science and Technology, Saudi Arabia)

UWB Microwave Imaging Array for Nondestructive Testing Applications ***1502***
S.F. Hatfield (Missouri University of Science and Technology, USA)
M.A.Hillstrom (Missouri University of Science and Technology, USA)
D.N.Schultz (Missouri University of Science and Technology, USA)
T.M. Werckmann (Missouri University of Science and Technology, USA)
M.T. Ghasr (Missouri University of Science and Technology, USA)
K.M. Donnell (Missouri University of Science and Technology, USA)

An Experiment Set-Up for Analysis of Lateralization Judgments of Binaural Stimuli ***1507***
J.S. Nogueira (Universdade Federal da Bahia, Brazil)
A.I. Cunha (Universdade Federal da Bahia, Brazil)
M.C.B.F.M. Braghiroli (Universidade Federal da Bahiaa, Brazil)
R.C.S. Freire (Univ. Federal de Campina Grande, Brazil)

PS5C (Poster Session): Measurement and Instrumentation for Industrial Applications
Room: Pavilion
Chair: *Marco Landi (University of Salerno, Italy)*

Calibration Technique for Sensitivity Variation in RVDT Type Accelerator Position Sensor ***1512***
Jong-Kyoung Lee (Korea Advanced Institute of Science and Technology (KAIST), Korea)
Young-Hun Ko (Korea Advanced Institute of Science and Technology (KAIST), Korea)
Sang-Gug Lee (Korea Advanced Institute of Science and Technology (KAIST), Korea)

Two-Dimensional (2D) Plane Accuracy of Linear Motor Feeding Stages Enhanced by Using the Numerical Algorithm Compensation Method ..... **N/A**
Wen-Tse Hsiao (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Shih-Feng Tseng (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Chien-Kai Chung (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Chun-Jen Chen (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Kuo-Cheng Huang (Instrument Technology Research Center, Taiwan)
Ming-Fei Chen (National Changhua University of Education, Taiwan)

Power Efficient Analog to Digital Conversion for the Li-ion Battery Voltage Monitoring and Measurement ..... **N/A**
Saeed Mian Qaisar (Free Lance, France)
Dominique Dallet (IMS-ENSEIRB, CNRS UMR 5218, France)
Sébastien Benjamin (SAFT, France)
Philippe Desprez (SAFT, France)
Reda Yahiaoui (Femto-ST, France)

PS5D (Poster Session): Signal and Image Processing Techniques
Room: Pavilion
Chair: *Marco Landi (University of Salerno, Italy)*

ADC Spectral Testing Allowing Amplitude Clipping ***1526***
Li Xu (Iowa State University, USA)
Degang Chen (Iowa State University, USA)

The Implementation and Performance Analysis of AWMMF Parallel Algorithm on GPU ***1530***
Weiyang Mu (Harbin Institute of Technology, P.R. China)
Jing Jin (Harbin institute of Technology, P.R. China)
Hongqi Feng (China Astronaut Research and Training Center, P.R. China)
Qiang Wang (Harbin Institute of Technology, P.R. China)

Adaptive Window Multistage Median Filter for Image Salt-and-pepper Denoising ***1535***
Weiyang Mu (Harbin Institute of Technology, P.R. China)
Jing Jin (Harbin institute of Technology, P.R. China)
Hongqi Feng (China Astronaut Research and Training Center, P.R. China)
Qiang Wang (Harbin Institute of Technology, P.R. China)

A Novel 3D Approach for the Extraction of the Wetting Front in CT Images of Soil Profiles ***1540***
Dionicio Vásquez (Federal University of Rio Grande do Sul, Brazil)
Jacob Scharcanski (Federal University of Rio Grande do Sul, Brazil)
Alexander Wong (University of Waterloo, Canada)
Silvio Crestana (EMBRAPA, Brazil)

PS5E (Poster Session): Data Acquisition Systems and Techniques
Room: Pavilion
Chair: *Michael Schmitz (North Dakota State University, USA)*

Data Compression Using Mixed Cascade of Nonlinear Logic ***1544***
Sunil R. Das (Troy University, USA & University of Ottawa, Canada)
Danny L. Shaw (Troy University, USA)
Satyendra N. Biswas (Independent University, Bangladesh)
Mansour H. Assaf (University of the South Pacific, Fiji)
Scott Morton (Troy University, USA)
Irem Ozkarahan (Troy University, USA)
Emil M. Petriu (University of Ottawa, Canada)
Voicu Groza (University of Ottawa, Canada)

Performance Analysis of Reconfigurable Ultrasonic System-on-Chip Hardware Platform ***1550***
Pramod Govindan (Illinois Institute of Technology, USA)
Spenser Gilliland (Illinois Institute of Technology, USA)
Alireza Kasaeifard (Illinois Institute of Technology, USA)
Thomas Gonnot (Illinois Institute of Technology, USA)
Jafar Saniie (Illinois Institute of Technology, USA)

A Random Demodulation Hardware System with Automatic Synchronization Function ***1554***
Ning Fu (Harbin Institute of Technology, P.R. China)
Pingfan Song (Harbin Institute of Technology, P.R. China)
Jingchao Zhang (Harbin Institute of Technology, P.R. China)
Ying Liu (Beijing Aerospace Automatic Control Institute, P.R. China)
Gang Wang (Harbin Institute of Technology, P.R. China)

8-bit Folding ADC Based on Switched Capacitor ***1559***
Wendell E.M. Costa (IFTO Palmas & UFCG Campina Grande, Paraiba, Brazil)
Sabiniano A. Rodrigues (IFPB João Pessoa-Paraíba & UFCG Campina Grande, Paraiba, Brazil)
Raimundo C.S. Freire (UFCG Campina Grande, Paraiba, Brazil)
Sebastian Yuri Catunda (UFRN Natal, Rio Grande do Norte, Brazil)
Fernando Rangel de Sousa (UFSC Santa Catarina, Brazil)

PS5F (Poster Session): Measurement of Electric and Magnetic Quantities
Room: Pavilion
Chair: *Michael Schmitz (North Dakota State University, USA)*

Complex Dielectric Permittivity and Magnetic Permeability Measurement of Ferrite Powders at MIllimeter Wavelength ***1564***
Liu Chao (Tufts University, USA)
Mohammed N. Afsar (Tufts University, USA)

Operation of the Van Veen Loop In a Shielded Chamber ***1567***
James McLean (TDK R&D Corp, USA)
Hidetsugu Sako (TDK R&D Corp, USA)
Armando Medina (TDK R&D Corp, USA)
Robert Sutton (TDK R&D Corp, USA)

Non-Contact EM Measurement of the Properties of Power Station Steels Taken from Service .. ***1573***
N. Karimian (University of Manchester, United Kingdom)
W. Yin (University of Manchester, United Kingdom)
J. Liu (University of Birmingham, United Kingdom)
X.J. Hao (University of Birmingham, United Kingdom)
M. Strangwood (University of Birmingham, United Kingdom)
C.L. Davis (University of Birmingham, United Kingdom)
A.J. Peyton (University of Manchester, United Kingdom)

Design Criteria of Digital Filters for Synchrophasor Estimation ***1579***
David Macii (University of Trento, Italy)
Grazia Barchi (University of Trento, Italy)
Dario Petri (University of Trento, Italy)

Design and Uncertainty Analysis of a Bioimpedance Measurement Channel ***1585***
Adalberto Schuck, Jr. (UFRGS, Brazil)
Alexandre Balbinot (UFRGS, Brazil)
Rodrigo Wolff Porto (UNIVATES, Brazil)

PS5G (Poster Session): Instrumentation and Measurement for Improving Quality, Reliability and Safety
Room: Pavilion
Chair: *Marcantonio Catelani (University of Florence, Italy)*

Design and Development of an Accelerated Testing Architecture for Embedded Systems Fault Monitoring ***1590***
Valeria L. Scarano (University of Florence, Italy)
Marcantonio Catelani (University of Florence, Italy)
Daniele Mazzei (University of Pisa, Italy)
Andrea Carignano (I&S Global Design - bioMérieux Italia S.p.A., Italy)
Giacomo Baldi (Errequadro Srl, Italy)

Reliability and availability analysis of an automatic highway toll collection system ***1594***
Marcantonio Catelani (University of Florence, Italy)
Lorenzo Ciani (University of Florence, Italy)
Emiliano S. Paolilli (University of Florence, Italy)

Design and Implementation of a on-board Device for Photovoltaic Panels monitoring ***1599***
Lorenzo Ciani (Università degli Studi di Firenze, Italy)
Loredana Cristaldi (Politecnico di Milano, Italy)
Marco Faifer (Politecnico di Milano, Italy)
Massimo Lazzaroni (Università degli Studi di Milano, Italy)
Marco Rossi (Politecnico di Milano, Italy)

A Yawning Measurement Method Using Embedded Smart Cameras ***1605***
Shabnam Abtahi (University of Ottawa, Canada)
Shervin Shirmohammadi (University of Ottawa, Canada)
Behnoosh Hariri (Google Inc., USA)
Daniel Laroche (CogniVue Corp., Canada)
Luc Martel (CogniVue Corp., Canada)

10:35 - 12:40
S8A: Measurement Applications
Room: Great Hall
Chair: *Julio Barros (University of Cantabria, Spain)*

Performance Measurements of an Optical Detector Designed for Monolithic Integration with a Power VDMOS ***1609***
Raha Vafaei (University of Grenoble & CNRS, G2Elab, France)
Jean-Christophe Crebier (University of Grenoble & CNRS, G2Elab, France)
Nicolas Rouger (University of Grenoble & CNRS, G2Elab, France)

High Memory Passive RFID Tags with Multi-modal Sensor Design and Application to Asset Monitoring In-transit ***1615***
Haifeng Niu (Missouri University of Science and Technology, USA)
S. Jagannathan (Missouri University of Science and Technology, USA)

The UHF Gen 2 RFID System for Transcutaenous Operation for Orthopedic Implants ***1620***
Xiaoyu Liu (University of Pittsburgh, USA)
Joshua R. Stachel (University of Pittsburgh, USA)
Ervin Sejdić (Univerisity of Pittsburgh, USA)
Marlin H. Mickle (University of Pittsburgh, USA)
J. Lee Berger (Ortho-tag Inc, USA)

Innovative Software Solution for Special Data Evaluation in Mass Spectrometry ***1624***
Heidi Fleischer (University of Rostock, Germany)
Kerstin Thurow (Center for Life Science Automation,Celisca, Germany)

A Holographic In-Line Imaging System for Meteorological Applications ***1630***
Ville A. Kaikkonen (University of Oulu, Finland)
Dmitry Ekimov (Petrozavodsk State University, Russia)
Anssi J. Mäkynen (University of Oulu, Finland)

S8B: Real-Time Measurement
Room: Hiawatha 1
Chair: *Vincenzo Piuri (University of Milan, Italy)*

Correlation Based Detection and Localization of R/C Electronic Devices Using Array Detectors ***1636***
Vivek Thotla (Missouri University of Science and Technology, USA)
Maciej Zawodniok (Missouri University of Science and Technology, USA)
S. Jagannathan (Missouri University of Science and Technology, USA)
Sanjeev Agarwal (Night Vision and Electronic Sensors Directorate, USA)

Real-time Measurement of the Weld Pool Surface in GTAW Process ***1640***
WeiJie Zhang (University of Kentucky, USA)
YuKang Liu (University of Kentucky, USA)
YuMing Zhang (University of Kentucky, USA)

On Benchmarking Non-Blind Deconvolution Algorithms: A Sample Driven Comparison of Image De-blurring Methods for Automated Visual Inspection Systems ***1646***
Dorian Schneider (RWTH Aachen University, Germany)
Tilo van Ekeris (RWTH Aachen University, Germany)
Joschka zur Jacobsmuehlen (RWTH Aachen University, Germany)
Sebastian Gross (RWTH Aachen University, Germany)

Robust Pattern Recognition of Three Dimensional Weld Pool Surface in Gas Tungsten Arc Welding ***1652***
WeiJie Zhang (University of Kentucky, USA)
Xiang Zhang (University of Kentucky, USA)
YuKang Liu (University of Kentucky, USA)
YuMing Zhang (University of Kentucky, USA)

S8C: Advances in Instrumentation and Measurement Developments and Techniques
Room: Hiawatha 2
Chair: *Mohammed Al-Janabi (University of Westminster, London, United Kingdom)*

Flame Stability Monitoring Through Statistical Analysis of Medial Axis ***1658***
Tian Qiu (University of Kent, United Kingdom)
Yong Yan (University of Kent, United Kingdom)
Gang Lu (University of Kent, United Kingdom)

FPGA based Architectures for High Performance Adaptive FIR Filter Systems ***1662***
Sufeng Niu (Illinois Institute of Technology, USA)
Semih Aslan (Texas State University, USA)
Jafar Saniie (Illinois Institute of Technology, USA)

A New Method to Detect Fault Gas in Insulation Oil using NIR Spectroscopy and Multivariate Calibration ***1666***
Gilze Borges (CEFET-MG, Brazil)
Jarbas Rohwedder (UNICAMP, Brazil)
Edson Bortoni (UNIFEI, Brazil)

Modelling, parametric analysis, and optimization of an experimental set-up for acoustic antenna calibration ***1670***
Orsola Petrella (Italian Aerospace Research Centre, CIRA, Italy)
Salvatore Ameduri (Italian Aerospace Research Centre, CIRA, Italy)
Vincenzo Quaranta (Italian Aerospace Research Centre, CIRA, Italy)
Giovanni Betta (University of Cassino, Italy)
Marco Laracca (University of Cassino, Italy)

Flaw Characterization in Ultrasonic Non-destructive Testing Method Using Exponential Modeling ***1676***
Hossein Ravanbod (Sharif University of Technology, Iran)
Fatemeh Karimi (Electronic Research Institute, Iran)
Hamidreza Amindavar (Amirkabir University of Technology, Iran)

SS6 (Part 2): RF/Microwave Materials and Characterization
Room: Hiawatha 3
Chair: *Samir Trabelsi (USDA, USA)*

Broadband Permittivity Measurements of Low-Loss Materials using the Hilbert Transform..... ***1680***
Phil Bartley (Innovative Measurement Solutions, Inc., USA)
Shelley Begley (Agilent Technologies, Inc, USA)

Investigating Effects of Aging on Radiofrequency Dielectric Properties of Chicken Meat ***1685***
Samir Trabelsi (U.S. Department of Agriculture, USA)

Measuring the Complex Permittivity of Poultry Meat with a Planar Transmission-Line Sensor.. ***1689***
Jochem Roelvink (United States Department of Agriculture, USA)
Samir Trabelsi (United States Department of Agriculture, USA)

Interferometric Technique for Scanning Near-field Microwave Microscopy Applications ***1694***
H.Bakli (University of Lille1/IEMN, France)
K. Haddadi (University of Lille1/IEMN, France)
T. Lasri (IEMN - University of Lille, France)

Microwave Moisture Sensing Through Use of a Piecewise Density-Independent Function ***1699***
Murat Sean McKeown (The University of Georgia, USA)
Samir Trabelsi (U.S. Department of Agriculture, USA)
Ernest William Tollner (The University of Georgia, USA)

SS7 (Part 2): Advanced Measurement and Data Processing for Engineering System Health Monitoring
Room: Rock Island
Chair: *Ruqiang Yan (Southeast University, P.R. China)*

Matching Demodulation Transform with Applications to Feature Extraction of Rotor Rub-impact Fault..... ***1703***
Shibin Wang (Xi'an Jiaotong University, P.R. China)
Guoying Li (Xi'an Jiaotong University, P.R. China)
Xuefeng Chen (Xian Jiaotong University, P.R. China)
Yi Xia (AVIC Xi'an Aero-engine (Group) Ltd., P.R. China)
Zhonghua Liu (AVIC Xi'an Aero-engine (Group) Ltd., P.R. China)

MEMS Gyroscope Sensors for Wind Turbine Blade Tip Deflection Measurement *1708*
Xu Fu (GE Global Research, P.R. China)
Lihan He (GE Global Research, P.R. China)
Hai Qiu (GE Global Research, P.R. China)

Bearing Performance Degradation Evaluation Using Recurrence Quantification Analysis and Auto-regression Model..... *1713*
Yuning Qian (Southeast University, P.R. China)
Shijie Hu (Southeast University, P.R. China)
Ruqiang Yan (Southeast University, P.R. China)

System Architecture of Intelligent Personal Communication Node for Body Sensor Network ... *1717*
Won-Jae Yi (Illinois Institute of Technology, USA)
Sufeng Niu (Illinois Institute of Technology, USA)
Thomas Gonnot (Illinois Institute of Technology, USA)
Jafar Saniie (Illinois Institute of Technology, USA)

Envelope analysis by wavelet-filter based spectral kurtosis for bearing health monitoring..... *1721*
Weihua Li (South China University of Technology, P.R. China)
Zhidong Huang (South China University of Technology, P.R. China)
Huibin Lin (South China University of Technology, P.R. China)
Kang Ding (South China University of Technology, P.R. China)

1:55 - 4:00
S9A: Measurement Applications
Room: Great Hall
Chair: *Lee A Barford (Measurement Research Laboratory, Agilent Technologies & University of Nevada, USA)*

Fault Detection Method Based on HHT for Spacecraft Mono-propellant Propulsion System *1725*
Miao Zhang (Harbin Institute of Technology, P.R. China)
Zhenzhou Lai (Harbin Institute of Technology, P.R. China)
Dan Li (Harbin Institute of Technology, P.R. China)
Yibo Wang (Harbin Institute of Technology, P.R. China)
Yi Shen (Harbin Institute of Technology, P.R. China)
Yan Wang (Harbin Institute of Technology, P.R. China)

Relative Localization Methodology for Autonomous Robots in Collaborative Environments *1730*
Andrei Stancovici (Politehnica University of Timisoara, Romania)
Sinziana Indreica (Politehnica University of Timisoara, Romania)
Mihai V. Micea (Politehnica University of Timisoara, Romania)
Vladimir Cretu (Politehnica University of Timisoara, Romania)
Voicu Groza (University of Ottawa, Canada)

Statistical Models approach for Solar Radiation Prediction *1734*
S. Ferrari (Università degli Studi di Milano, Italy)
M. Lazzaroni (Università degli Studi di Milano, Italy)
V. Piuri (Università degli Studi di Milano, Italy)
L. Cristaldi (Politecnico di Milano, Italy)
M. Faifer (Politecnico di Milano, Italy)

Quantitative Measurement of Gas Component Using Multisensor Array and NPSO-based LS-SVR *1740*
Kai Song (Harbin Institute of Technology, P.R. China)
Qi Wang (Harbin Institute of Technology, P.R. China)
Jianfeng Li (Harbin Insititute of Technology, P.R. China)
Hongquan Zhang (No. 49 Institute, China Electronics Technology Group Corporation, P.R. China)

Massively Parallel Jitter Measurement from Deep Memory Digital Waveforms *1744*
Torbjorn Loken (University of Nevada, USA)
Lee Barford (Agilent Technologies & University of Nevada, USA)
Frederick C. Harris, Jr. (University of Nevada, USA)

S9B: Medical Instrumentation
Room: Hiawatha 1
Chair: *Kurt Barbé (VUB, Belgium)*

Influence of the type and position of the sensor on the precision of impedance glucose measurements *1750*
Oscar Olarte (Vrije Universiteit Brussel & ELEC, Belgium)
Wendy Van Moer (Vrije Universiteit Brussel, Belgium)
Kurt Barbé (Vrije Universiteit Brussel & ELEC, Belgium)
Yves Van Ingelgem (Vrije Universiteit Brussel, Belgium)
Annick Hubin (Vrije Universiteit Brussel (VUB), Belgium)

Small Device for Counting the Number of Manual Wheelchair Strokes *1755*
Yoshio Tanimoto (Kibikogen Rehabilitation Center, Japan)
Kuniharu Nanba (Kibikogen Rehabilitation Center, Japan)
Kazunari Furusawa (Kibikogen Rehabilitation Center, Japan)
Hideki Yamamoto (Kibikogen Rehabilitation Center, Japan)
Akihiro Tokuhiro (Kibikogen Rehabilitation Center, Japan)
Hiroyuki Ukida (The University of Tokushima, Japan)

Medical Ultrasound Power Measurement System using PVDF Sensor and FPGA Technology .. *1761*
Imamul Muttakin (Universiti Teknologi Malaysia, Malaysia)
Eko Supriyanto (Universiti Teknologi Malaysia, Malaysia)

Basic Experiment of Blood-pressure Measurement which Uses FBG Sensors *1767*
Yuki Miyauchi (Shinshu University, Japan)
Shouhei Koyama (Shinshu University, Japan)
Hiroaki Ishizawa (Shinshu University, Japan)

S9C: Signal and Image Processing Techniques
Room: Hiawatha 2
Chair: *Octavia A. Dobre (Memorial University of Newfoundland, Canada)*

Blind Separation of Speech Sources in Multichannel Compressed Sensing *1771*
Qiao Li-yan (Harbin Institute of Technology, P.R. China)
Congru Yin (Harbin Institute of Technology, P.R. China)
Hongwei Xu (Harbin Institute of Technology, P.R. China)
Hongpeng Li (Beijing Institute of Remote Sensing Equipment, P.R. China)
Ning Fu (Harbin Institute of Technology, P.R. China)
Yigang Zhang (Harbin Institute of Technology, P.R. China)

Large Scale Optical Position Sensitive Detector *1775*
Christoph Gugg (University of Leoben, Austria)
Paul O'Leary (University of Leoben, Austria)
Matthew Harker (University of Leoben, Austria)

Performance Analysis of OMP Algorithm in Recovering Magnitude Decaying Sparse Signals in Compressive Sensing ***1781***
Jia Li (Harbin Institute of Technology, P.R. China)
Qiang Wang (Harbin Institute of Technology, P.R. China)
Yi Shen (Harbin Institute of Technology, P.R. China)
Bo Li (Harbin Institute of Technology, P.R. China)

Experimental results for M-FSK signal classification and parameter estimation ***1786***
Hongfei Wang (Memorial University, Canada)
Octavia A. Dobre (Memorial University, Canada)
Cheng Li (Memorial University, Canada)
Robert Inkol (Defence Research and Development Canada, Canada)

Compressed Video Watermarking Technique ***1790***
Satyendra N. Biswas (Ahsanullah University of Science and Technology, Bangladesh)
Tauhidul Hasan (Ahsanullah University of Science and Technology, Bangladesh)
Suvashis DasGupta (Ahsanullah University of Science and Technology, Bangladesh)
Sunil R. Das (Troy University, USA & University of Ottawa, Canada)
Voicu Groza (University of Ottawa, Canada)
Emil M. Petriu (University of Ottawa, Canada)
Mansour H. Assaf (University of the South Pacific, Fiji)

S9D: Techniques Related to Instrumentation
Room: Hiawatha 3
Chair: *Claudio Narduzzi (Universita' di Padova, Italy)*

An Innovative Exciting Coil Design for Magneto-Optic Imaging in Nondestructive Evaluation ... ***1795***
Yuhua Cheng (University of Electronic Science and Technology of China, P.R. China)
Xingmake Liu (University of Electronic Science and Technology of China, P.R. China)
Yiming Deng (University of Colorado-Denver, USA)

A survey on Time-to-Digital Conversion Techniques Based on Independent Coding Lines ..... ***N/A***
R. Szplet (Military University of Technology, Poland)
P. Kwiatkowski (Military University of Technology, Poland)
Z. Jachna (Military University of Technology, Poland)
K. Rozyc (Military University of Technology, Poland)

Fast Flow Regime Recognition Method of Gas/Water Two-Phase Flow Based on Extreme Learning Machine **1807**
Jia Zhao (Tianjin University, P.R. China)
Feng Dong (Tianjin University, P.R. China)
Chao Tan (Tianjin University, P.R. China)

Pulse-Width Programmable Gain Integrating Amplifier ***1812***
Anderson Paiva de Figueiredo (Federal University of Rio Grande do Norte, Brazil)
Michel Santana de Deus (Federal University of Rio Grande do Norte, Brazil)
Sebastian Yuri Cavalcanti Catunda (Federal University of Rio Grande do Norte, Brazil)
Fernando Rangel de Sousa (Federal University of Santa Catarina, Brazil)

A Design of Fibre Channel Node with PCI Interface ***1817***
Liansheng Liu (Harbin Institute of Technology, P.R. China)
Chuan Liu (Harbin Institute of Technology, P.R. China)
Yu Peng (Harbin Institute of Technology, HIT, P.R. China)
Datong Liu (Harbin Institute of Technology, P.R. China)

S9E: Measurement and Instrumentation for Industrial Applications
Room: Rock Island
Chair: *Alessandra Flammini (University of Brescia, Italy)*

Evaluation of Indication Performance Using Contrast Sensitivity Chart Based on Novel Photometry ***1823***
Hiroki Maru (Shinshu University, Japan)
Kim Ikhwan (Shinshu University, Japan)
Hiroyuki Kanai (Shinshu University, Japan)
Masayoshi Kamijo (Shinshu University, Japan)

Performance Analysis of a Clock State Estimator for PROFINET IO IRT Synchronization ***1828***
D. Fontanelli (University of Trento, Italy)
D. Macii (University of Trento, Italy)
S. Rinaldi (University of Brescia, Italy)
P. Ferrari (University of Brescia, Italy)
A. Flammini (University of Brescia, Italy)

Automatic inspection of backlight modules by using support vector regressions ***1834***
Wu-Ja Lin (National Formosa University, Taiwan)
Sin-Sin Jhuo (National Formosa University, Taiwan)

Estimation and analysis of communication service time in a real-time wireless industrial network ***1838***
Matteo Bertocco (University of Padova, Italy)
Claudio Narduzzi (Universita' di Padova, Italy)
Federico Tramarin (National Research Council (CNR) of Italy)
Lucia Seno (National Research Council (CNR) of Italy)
Stefano Vitturi (National Research Council (CNR) of Italy)

Real-time Apparent Density Measurement of the Working Fluid in Outlet Pipes of a Steam-injection Boiler ***1844***
Quansheng Duan (North China Electric Power University, P.R. China)
Lijuan Wang (North China Electric Power University, P.R. China)
Yong Yan (University of Kent, United Kingdom)
Shengjian Jiang (Huanxiling Oil Production Factory of Liaohe Oilfield Co., Ltd, P.R. China)
Jiaping Bi (Huanxiling Oil Production Factory of Liaohe Oilfield Co., Ltd, P.R. China)
Wenchao Li (Panjin Liaonan Group, Liaohe Oilfiled Co., Ltd, P.R. China)
Haiwen Du (Huanxiling Oil Production Factory of Liaohe Oilfield Co., Ltd, P.R. China)
Limin Yang (Panjin Liaonan Group, Liaohe Oilfiled Co., Ltd, P.R. China)
Shuai Zhang (North China Electric Power University, P.R. China)
Qiusheng Gao (North China Electric Power University, P.R. China)

AUTHOR INDEX