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and Measurement Technology
Conference

Instrumentation and Measurement for Sustainable Development

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PROCEEDINGS

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C. Biasi (University Paulista, Brazil)
A.C.B.C.F. Pinto (Faculty of Veterinary Medicine of University of São Paulo, Brazil)
R.G. Lima (Polytechnic School of University of São Paulo, Brazil)

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Luiz Alberto Luz de Almeida (Universidade Federal do ABC, Brazil)
Carlos Ferreira (Instituto Militar de Engenharia, Brazil)
Helmut Neff (Federal University of Campina Grande, Brazil)

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Yi Shen (Harbin Institute of Technology, P.R. China)
Naizhang Feng (Harbin Institute of Technology, P.R. China)

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Chinthaka P. Gooneratne (King Abdullah University of Science and Technology, Saudi Arabia)

Jürgen Kosel (King Abdullah University of Science and Technology, Saudi Arabia)

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Marco Dionigi (University of Perugia, Italy)

Mauro Mongiardo (University of Perugia, Italy)

Antonio Moschitta (University of Perugia, Italy)

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Haicheng Yang (Nanjing University of Science and Technology, P.R. China)

Jieting Qui (Champion Geophysical Technology Ltd., P.R. China)

Hai Dong (Champion Geophysical Technology Ltd., P.R. China)

Fabao Yan (Champion Geophysical Technology Ltd., P.R. China)

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Mariacarla Lugarà (University Mediterranea of Reggio Calabria, Italy)

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Yi Shen (Harbin Institute of Technology, P.R. China)
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Thomas Günther (Technische Universität Chemnitz, Germany)
Abderrahmane Benchirouf (Technische Universität Chemnitz, Germany)
Roman Gruden (Technische Universität Chemnitz, Germany)
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Ernesto Casciaro (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)
Antonio Greco (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)
Stefano Leporatti (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)
Aimè Lay-Ekuakille (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)
Giuseppe Gigli (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)

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Binbin Ni (Huazhong University of Science and Technology, P.R. China)
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Paolo Cova (University of Parma, INFN Pavia, Italy)
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<i>Michele Tavernelli (University of Perugia, Italy)</i>	
<i>Pisana Placidi (University of Perugia, Italy)</i>	
<i>Paolo Valigi (University of Perugia, Italy)</i>	
<i>Domenico Caputo (Sapienza University of Rome, Italy)</i>	
<i>Giampiero de Cesare (Sapienza University of Rome, Italy)</i>	
<i>Giulia Petrucci (Sapienza University of Rome, Italy)</i>	
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<i>Eduardo E Zurek (Universidad del Norte, Colombia)</i>	
<i>Roque J. Hernandez (Universidad del Norte, Colombia)</i>	
<i>Oscar Hernandez (Universidad del Norte, Colombia)</i>	

16:15 - 18:00

S7A: Advances in Instrumentation and Measurement Developments and Techniques (part 4)

Room: Conference Room

A reconfigurable CMOS pixel for applying tone mapping on high dynamic range images	1098
<i>Luiz Carlos Gouveia (University of Glasgow, United Kingdom)</i>	
<i>Waqas Mughal (University of Glasgow, United Kingdom)</i>	
<i>Bhaskar Choubey (University of Oxford, United Kingdom)</i>	

Sensing and Decoding of Visual Stimuli using Commercial Brain Computer Interface Technology	1102
<i>Kiran George (California State Fullerton, USA)</i>	
<i>Adrian Iniguez (California State University Fullerton, USA)</i>	
<i>Hayden Donze (California State University Fullerton, USA)</i>	

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<i>Leiva Casemiro Oliveira (Universidade Federal de Campina Grande, Brazil)</i>	
<i>Marcos R.A. Morais (Universidade Federal de Campina Grande, Brazil)</i>	
<i>Antonio Marcus Nogueira Lima (Universidade Federal de Campina, Brazil)</i>	
<i>Helmut Neff (Federal University of Campina Grande, Brazil)</i>	

Tomographic Imaging Based Measurement of Three-dimensional Geometric Parameters of a Burner Flame	1111
<i>Md. Moinul Hossain (University of Kent, UK)</i>	
<i>Gang Lu (University of Kent, UK)</i>	
<i>Yong Yan (University of Kent, UK)</i>	

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S7C: Non-invasive Measurement Techniques and Instrumentation (part 2)

Room: Cezanne

Hermetically Sealed Microwave Probe for in-situ Detection of Black Powder in Gas Pipelines.....	1115
<i>Mohamed A Abou-Khousa (The Petroleum Institute, UAE)</i>	
<i>Ahmed Al-Durra (The Petroleum Institute, UAE)</i>	
<i>Khaled Al-Wahedi (The Petroleum Institute, UAE)</i>	

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<i>Giovanni Betta (University of Cassino and Southern Lazio, Italy)</i>	
<i>Luigi Ferrigno (University of Cassino and Southern Lazio, Italy)</i>	
<i>Marco Laracca (University of Cassino and Southern Lazio, Italy)</i>	
<i>Pietro Burrascano (University of Perugia, Italy)</i>	
<i>Marco Ricci (University of Perugia, Italy)</i>	

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Arezoo Emadi (University of Manitoba, Canada)
Jose Mijares-Chan (University of Manitoba, Canada)
Douglas Andrew Buchanan (University of Manitoba, Canada)

Code-Division-Multiplexing Using Orthogonal Codes for Fast Electrical Impedance Tomography 1130
Martin Gevers (Ruhr-Universität Bochum, Germany)
Patrik Gebhardt (Ruhr-Universität Bochum, Germany)
Thomas Musch (Ruhr-Universität Bochum, Germany)
Michael Vogt (Ruhr-Universität Bochum, Germany)

16:15 - 18:00

SS1P2: Nanotechnology applications in Measurement and Instrumentation (part 2)

Room: Renoir D

Design and Simulation of 10 MHz MEMS Oscillator 1134
Syamsi Taufik (International Islamic University Malaysia, Malaysia)
Ahmad Anwar Zainuddin (International Silteerra Malaysia, Lot 8, Phase II Kulim Hi-Teck Park, Malaysia)
Sheroz Khan (International Islamic University Malaysia, Malaysia)
Anis N. Nordin (International Islamic University Malaysia, Malaysia)

Laser Fluence and Exposure Time Effects on Optoacoustic Signal from Gold Nanorods for Enhanced Medical Imaging 1139
Giulia Soloperto (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)
Francesco Conversano (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)
Ernesto Casciaro (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)
Antonio Greco (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)
Giuseppe Gigli (Università del Salento, Italy)
Aimè Lay-Ekuakille (University of Salento, Italy)
Sergio Casciaro (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)

GF(2 4) Multiplier in Hardware Using Discrete Neural Network 1144
Vanderson Lima Reis (CMDI-IFAM, IFTO, Brazil)
Wendell E. M. Costa (IFTO, Universidade Federal de Campina Grande, Brazil)
Raimundo C. S. Freire (Universidade Federal de Campina Grande - PB, Brazil)
Francisco M. de Assis (Universidade Federal de Campina Grande, Brazil)
Ewaldo Santana (University of State of Maranhao, Brazil)

16:15 - 18:00

SS7P2: Energy Harvesting for Autonomous Measurement Systems: methodologies and devices (part 2)

Room: Renoir E

Performance Characterization of different nonlinear-transduction mechanisms for piezoelectric energy harvesting 1148
Carlo Trigona (DIEEI University of Catania, Italy)
Felice Maiorca (DIEEI University of Catania, Italy)
F. Giusa (DIEEI University of Catania, Italy)
A. Noto (DIEEI, Italy) (DIEEI University of Catania, Italy)
Bruno Andò (DIEEI University of Catania, Italy)
Salvatore Baglio (DIEEI University of Catania, Italy)

Electrodynamic Resonant Energy Harvester for Low Frequencies and Amplitudes 1152
Sonia Bradai (Technische Universität Chemnitz, Germany, University of Sfax, Tunisia)
Slim Naifar (Technische Universität Chemnitz, Germany, University of Sfax, Tunisia)
Thomas Keutel (Technische Universität Chemnitz, Germany)
Olfa Kanoun (Technische Universität Chemnitz, Germany)

Design of a vibration energy harvester by twin lateral magnetoelectric transducers 1157
Sonia Bradai (Technische Universität Chemnitz, Germany, University of Sfax, Tunisia)
Slim Naifar (Technische Universität Chemnitz, Germany, University of Sfax, Tunisia)
Thomas Keutel (Technische Universität Chemnitz, Germany)
Olfa Kanoun (Technische Universität Chemnitz, Germany)

Thursday, May 15

09:15 - 10:30

S8A: Signal & Image Processing Techniques (part 1)

Room: Conference Room

Blind Recognition of SC-FDMA Signals Using Second-Order Cyclostationarity 1163
Walid A. Jerjawi (Memorial University of Newfoundland, Canada)
Yahia A. Eldemerdash (Memorial University of Newfoundland, Canada)
Octavia A. Dobre (Memorial University of Newfoundland, Canada)

Measuring the Incidence of Packet Loss on Video Quality in Digital Television 1167
Jose Joskowicz (Universidad de la República & Facultad de Ingeniería, Uruguay)
Rafael Sotelo (Universidad de Montevideo, Uruguay)

A Structured Light Approach for 3d Surface Reconstruction with a Stereo Line-Scan System.. 1171
Erik Lilienblum (Otto-von-Guericke University Magdeburg, Germany)
Ayoub Al-Hamadi (Otto-von-Guericke University Magdeburg, Germany)

09:15 - 10:30

S8B: Measurement and Instrumentation for Industrial Applications (part 1)

Room: Gauguin

On the Use of Broadband Ultraviolet Detector Calibration 1177
Pietro Fiorentin (University of Padova, Italy)
Alessandro Scroccaro (University of Padova, Italy)

Noise Analysis and Characterization of a Charge-Balancing-Based Capacitive Sensor Interface with Resistive Reference..... 1182
Ruimin Yang (Delft University of Technology, The Netherlands)
Stoyan Nihtianov (Delft University of Technology, The Netherlands)

On Road Testing of Control Strategies for Semi-Active Suspensions 1187
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)

09:15 - 10:30

SS4P1: Sensors and Instrumentation for the Environment and Climate change Monitoring (part 1)

Room: Cezanne

Differential Optical Absorption Spectroscopy System for multi purpose applications 1193

Javier A. Ramos (Universidad de la República, Uruguay)

Matías Osorio (Universidad de la República, Uruguay)

Gastón Belsterli (Universidad de la República, Uruguay)

Erna Frins (Universidad de la República, Uruguay)

Miguel Barreto (Universidad de la República, Uruguay)

Performance Measurement in Wireless Sensor Networks using Time-Frequency Analysis and Neural Networks 1197

Chia-Pang Chen (National Taiwan University, Taiwan)

Joe-Air Jiang (National Taiwan University, Taiwan)

Subhas C. Mukhopadhyay (Massey University, New Zealand)

Nagender Kumar Suryadevara (Massey University, New Zealand)

09:15 - 10:30

S8D: Non-invasive Measurement Techniques and Instrumentation (part 3)

Room: Renoir D

SAR Imaging for Inspection of Metallic Surfaces at Millimeter Wave Frequencies 1202

Mohammad Tayeb Ghasr (Missouri University of Science and Technology, USA)

Kuang P. Ying (Missouri University of Science and Technology, USA)

Reza Zoughi (Missouri University of Science and Technology, USA)

A simple portable polychromatic pupillometer for human eye annoyance measurement 1207

Mario Bernabei (University of Modena and Reggio Emilia, Italy)

Luigi Rovati (University of Modena and Reggio Emilia, Italy)

Roberto Tinarelli (University of Bologna, Italy)

Lorenzo Peretto (University of Bologna, Italy)

Sensitivity Analysis of Wiener Filter-Based Synthetic Aperture Radar (SAR) Microwave Imaging Technique 1212

Mojtaba Fallahpour (University of Illinois at Urbana Champaign, USA)

Reza Zoughi (Missouri University of Science and Technology, USA)

09:15 - 10:30

S8E: Sensors and Sensor Fusion (part 1)

Room: Renoir E

State-dependent and distributed pedestrian tracking using the (C)PHD filter 1216

Johannes Pallauf (Karlsruhe Institute of Technology, Germany)

Fernando Puente León (Karlsruhe Institute of Technology, Germany)

Bearing Estimation of Coherent Signals using Compressive Sampling Array 1221

Yan Jing (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)

Optimization Design for Coercivity Characteristic of Spin Valve Giant Magneto Resistance 1226

Xiaodong Zhao (Beihang, P.R. China)

Zheng Qian (Bei Hang University, P.R. China)

10:30 - 12:45

PS9T: Energy and Power Systems (part 2)

Room: Picasso

A New Graphic Evaluator of the Voltage Unbalance in Power Networks 1230

Aurelian Crăciunescu (Politehnica University of Bucharest, Romania)

Mihaela Albu (Politehnica University of Bucharest, Romania)

Gloria Stefania Ciumbulea (University Politehnica of Bucharest, Romania)

Cătălina Necula Dumitrică (University Valahia of Targoviste, Romania)

Experimental Investigation on PLC Signal Crossing of Power Transformers 1235

Antonio Cataliotti (Università di Palermo, Italy)

Valentina Cosentino (Università di Palermo, Italy)

Dario Di Cara (National Research Council, Institute of Intelligent System for Automation, Italy)

Salvatore Guaiana (Università di Palermo, Italy)

Nicola Panzavecchia (National Research Council, Institute of Intelligent System for Automation, Italy)

Giovanni Tinè (National Research Council, Institute of Intelligent System for Automation, Italy)

Using Intelligent Systems in Experimental Signal Analysis for Power Transformer

Diagnosis 1240

Ivan N Silva (University of São Paulo, Brazil)

Rogério A. Flauzino (University of São Paulo, Brazil)

Daniilo Spatti (University of São Paulo, Brazil)

Carlos G. Gonzales (University of Sao Paulo, Brazil) Marcelo Carrapato (University of São Paulo, Brazil)

Paulo I. Costa (University of São Paulo, Brazil)

Thiago Bonfim (University of São Paulo, Brazil)

10:30 - 12:45

PS9U: Advances in Instrumentation and Measurement Developments and Techniques (part 3)

Room: Picasso

On Site Calibration of Current Transformers 1245

Gonzalo Aristoy (UTE, Uruguay)

Daniel Slomovitz (UTE, Uruguay)

Leonardo Trigo (UTE, Uruguay)

Alejandro Santos (UTE, Uruguay)

Automated Sensing, Interpretation and Conversion of Facial and Mental Expressions into Text

Acronyms using Brain-Computer Interface Technology 1247

Kiran George (California State University Fullerton, USA)

Adrian Iniguez (California State University Fullerton, USA)

Hayden Donze (California State University Fullerton, USA)

10:30 - 12:45

PS9W: Measurement Applications (part 3)

Room: Picasso

S-FSK modem design and experimental validation for robust narrowband powerline

communication 1251

Mohamed Chaker Bali (University of Carthage, Tunisia)

Chiheb Rebai (University of Carthage, Tunisia)

Automatic prismatic refractive power measuring instrument for eye-protector..... 1256

Wen-Hong Wu (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)

A Computational Intelligence approach to Solar Panel Modelling 1261

Stefano Ferrari (Università degli Studi di Milano, Italy)

Massimo Lazzaroni (Università degli Studi di Milano, INFN Milan, Italy)

Vincenzo Piuri (Università degli Studi di Milano, Italy)Ayse Salman (Doğuş University, Turkey)

Loredana Cristaldi (Politecnico di Milano, Italy)

Marco Faifer (Politecnico di Milano, Italy)

Sergio Toscani (Politecnico di Milano, Italy)

Initial Measurements and Results of a Multi-Channel, Adaptive Pre-distortion System for an Airborne Phased Array Radar..... 1267

Robert Lee (University of Oklahoma, USA)

Mark Yeary (University of Oklahoma, USA)

Caleb Fulton (University of Oklahoma, USA)

Rafael Rincon (NASA/Goddard Space Flight Center, USA)

Output Dynamic Range of Radiometers Based on Thermoresistive Sensors 1271

Vanuza M. Nascimento (Universidade Federal de Campina Grande - PB, Brazil)

Thais L. V. N. Silva (Universidade Federal de Campina Grande - PB, Brazil)

Viviane S.G. Martins (Universidade Federal de Campina Grande - PB, Brazil)

Petrov C. Lobo (Universidade Federal de Campina Grande - PB, Brazil)

Raimundo C.S. Freire (Universidade Federal de Campina Grande - PB, Brazil)

Use of a Resonant Sensor for Differential Air Pressure Measurements 1275

Karel Draxler (Czech Technical University in Prague, Czech Republic)

Jan Aueservald (Czech Technical University in Prague, Czech Republic)

Jaroslav Helgešik (Czech Technical University in Prague, Czech Republic)

Renata Styblikova (Czech Metrology Institute, Czech Republic)

10:30 - 12:45

PS9X: Non-invasive Measurement Techniques and Instrumentation (part 1)

Room: Picasso

Efficient Feature Extraction for an Automatic Ultrasound Testing Decision Support System..... 1279

Fábio da C. Cruz (Federal University of Bahia, Brazil)

Eduardo F. Simas Filho (Federal University of Bahia, Brazil)

Maria C. S. Albuquerque (Federal Institute of Bahia, Brazil)

Claudia T. T. Farias (Federal Institute of Bahia, Brazil)

Luciana Martinez (Federal University of Bahia, Brazil)

An investigation of cow feeding behavior using motion sensors 1285

Greg Bishop-Hurley (SSIRO Animal, Food and Health Sciences, Australia)
Dave Henry ((SSIRO Animal, Food and Health Sciences, Australia)
Daniel Smith (CSIRO Computational Informatics, Australia)
Ritaban Dutta (CSIRO Computational Informatics, Australia)
James Hill (Tasmanian Institute of Agriculture, University of Tasmania, Australia)
Richard Rawnsley (Tasmanian Institute of Agriculture, University of Tasmania, Australia)
Andrew Hellicar (CSIRO Computational Informatics, Australia)
Greg Timms (CSIRO Computational Informatics, Australia)
Ahsan Morshed (CSIRO Computational Informatics, Australia)
Ashfaqur Rahman (CSIRO Computational Informatics, Australia)
Claire D'Este (CSIRO Computational Informatics, Australia)
Yanfeng Shu (CSIRO Computational Informatics, Australia)

The Evaluation of Blood Flow Velocity and Heart Rate by the Frequency of Oxygen Saturation Fluctuation in Skin Tissue..... 1291

Hsin-Yi Tsai (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Kuo-Cheng Huang (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Min-Wei Hung (Instrument Technology Research center, National Applied Research Laboratories, Taiwan)
Ching-Ching Yang (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Wen-Tse Hsiao (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)

Measurements of Microwave Reflection Properties of Early-Age Concrete and Mortar Specimens 1295

Kwok Chung (University of Western Sydney, Australia)
Sergey Kharkovsky (University of Western Sydney, Australia)

Torque Estimation Using Rotor Slots Harmonics on a Three-Phase Induction Motor..... 1301

Wilton Lacerda Silva (Federal Institute of Bahia, Brazil)
Antonio Marcus Nogueira Lima (Federal University of Campina Grande, Brazil)
Amauri Oliveira (Federal University of Bahia, Brazil)

Representation of Induced and Transferred Charge in Measurement Signal of Electrostatic Sensors 1306

Chao Wang (Tianjin University, P.R. China)
Jingyu Zhang (Tianjin University, P.R. China)
Yishun Zhang (Tianjin University, P.R. China)
Yong Yan (University of Kent, United Kingdom)

10:30 - 12:45

PS9Y: Biomedical Systems

Room: Picasso

Bayesian Fusion of Multiple Sensors for Reliable Heart Rate Detection 1310

Valner Brusamarello (Federal University of Rio Grand do Sul, Brazil)
Gabriel Borges (Federal University of Rio Grand do Sul, Brazil)

Temperature Sensing and Controlling Biological Experiments by Using One Thermoelectric Module..... 1314

Yu-Chieh Chen (National Tsing-Hua University & Instrument Technology Research Center, Taiwan)
Kuo-Cheng Huang (Instrument Technology Research Center, Taiwan)
Han Chao Chang (Instrument Technology Research Center, Taiwan)
Tai-Lan Huang (Instrument Technology Research Center, Taiwan)
Hsin Chen (National Tsing Hua University, Taiwan)

A reconfigurable control system using EMG..... 1318

Juliette de Paula Felipe deOliveira (Federal University of Rio Grande do Norte, Brazil)
Ernano Arrais Junior (Federal University of Rio Grande do Norte, Brazil)
Valentin Oabc Roda (Federal University of Rio Grande do Norte, Brazil)

Optical System for Drop Volume Measurement..... 1322

Michele Norgia (Politecnico di Milano, Italy)
Alessandro Magnani (Politecnico di Milano, Italy)
Dario Melchionni (Politecnico di Milano, Italy)
Alessandro Pesatori (Politecnico di Milano, Italy)

Design, Implementation and Evaluation of a Brain-Computer Interface Controlled Mechanical Arm for Rehabilitation 1326

Kiran George (California State University Fullerton, USA)
Adrian Iniguez (California State University Fullerton, USA)
Hayden Donze (California State University Fullerton, USA)
Sheeba Kizhakkumthala (California State University Fullerton, USA)

10:30 - 12:45

PS9Z: Real-Time Measurement

Room: Picasso

Real-time pedestrian detection system with novel thermal features at night 1329

Chun-Fu Lin (National Chiao Tung University & Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Sheng-Fuu Lin (National Chiao Tung University, Taiwan)
Chi-Hung Hwang (Instrument Technology Research Center, Taiwan)
Yu-Chieh Chen (National Tsing-Hua University & Instrument Technology Research Center, Taiwan)

Test Point Optimization Process for a Real-Time Vibration Monitoring System on a Differential Axle Fixed Rig 1334

Martin Santacruz (Universidad Autonoma de Baja California & Universidad Estatal de Sonora, Mexico)
Marco Félix (Universidad Autónoma de Baja California, Mexico)
David Rosas (Universidad Autónoma de Baja California, Mexico)
Juan de Dios Ocampo (Universidad Autónoma de Baja California, Mexico)
Gabriel Luna (Universidad Estatal de Sonora, Mexico)

11:00 - 12:45

S9A: Signal & Image Processing Techniques (part 2)

Room: Conference Room

Adaptive Noise Tracking for Cognitive Radios under more realistic operation conditions 1339

Lee Gonzales-Fuentes (Vrije Universiteit Brussel, Belgium)
Kurt Barbé (Vrije Universiteit Brussel, Belgium)
Wendy Van Moer ((Vrije Universiteit Brussel, Belgium, University of Gavle, Sweden)

Pyramid based Multiscale Anisotropic Diffusion Filter for Ultrasound Image Despeckling 1345

Ting Liu (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)
Wenlei Pan (Harbin Institute of Technology, P.R. China)

Visual Aircraft Tracking System for Departures 1350

David Sandmann (University of Oklahoma, USA)
John W. Dyer (University of Oklahoma, USA)
John E. Fagan (University of Oklahoma, USA)
Dean Alexander (Federal Aviation Administration, USA)

Greedy Orthogonal Matching Pursuit Algorithm for Sparse Signal Recovery in Compressive Sensing 1355

Jia Li (Harbin Institute of Technology, P.R. China)
Zhaojun Wu (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)
Yipeng Liu (Harbin Institute of Technology, P.R. China)

11:00 - 12:45

S9B: Measurement and Instrumentation for Industrial Applications (part 2)

Room: Gauguin

Commercial TiO₂ P25 activation: evaluation of efficacy in photodegradation processes of different radiating sources 1359

Pietro Fiorentin (University of Padova, Italy)
Alessandro Scroccaro (University of Padova, Italy)
Roberta Bertani (University of Padova, Italy)
Matteo Moronato (University of Padova, Italy)
Fabio Simionato (University of Padova, Italy)
Alessandro Zaggia (University of Padova, Italy)

Self-Calibrating Optical 3D Pose Measurement Device for Offshore Sites 1364

Michael Habacher (University of Leoben, Austria)
Matthew Harker (University of Leoben, Austria)
Paul O'Leary (University of Leoben, Austria)

Portable Instrument for Eddy Currents Non-Destructive Testing based on Heterodyning Techniques 1368

Diogo E. Aguiam (Instituto Superior Técnico, Portugal)
Luis S. Rosado (Instituto Superior Técnico, Portugal)
Pedro M. Ramos (Instituto de Telecomunicações, IST, Portugal)
Moisés Piedade (Instituto Superior Técnico, Portugal)

Capacitive Sensor Interface with Improved Dynamic Range and Stability 1373

Roumen Nojdelov (Arsen Development Ltd., Bulgaria)
Stoyan Nihtianov (Delft University of Technology, The Netherlands)

11:00 - 12:45

SS4P2: Sensors and Instrumentation for the Environment and Climate change Monitoring (part 2)

Room: Cezanne

Flow Measurement of Gaseous CO₂ Using Averaging Pitot Tubes 1377

Kehinde Adefila (University of Kent, United Kingdom)

Yong Yan (University of Kent, United Kingdom)

Lijun Sun (Tianjin University, P.R. China)

Tao Wang (KROHNE Ltd, United Kingdom)

WSN Based Utility System for Effective Monitoring and Control of Household Power

Consumption 1382

Munhaw Kam (Massey University, New Zealand)

Nagender Kumar Suryadevara (Massey University, New Zealand)

Subhas C. Mukhopadhyay (Massey University, New Zealand)

Satinder P.S. Gill (Massey University, New Zealand)

Wireless Sensor Network and Web based Information System for Asthma Trigger Factors

Monitoring 1388

Ana Filipa Teixeira (Instituto de Telecomunicações, Instituto Universitario de Lisboa, Portugal)

Octavian Adrian Postolache (Instituto de Telecomunicações, Instituto Universitario de Lisboa, Portugal)

Wireless image-sensor network application for population monitoring of lepidopterous

insects pest (moths) in fruit crops 1394

Leonardo Barboni (Universidad de la República, Uruguay)

Mauricio Gonzalez (Universidad de la República, Uruguay)

Javier Schandy (Universidad de la República, Uruguay)

Nicolas Wainstein (Universidad de la República, Uruguay)

Alvaro Gomez (Universidad de la Republica Oriental del Uruguay, Uruguay)

Carlos Croce (Juventud Melilla Cooperativa Agraria R Ltda, Uruguay)

11:00 - 12:45

S9D: Data Acquisition Systems and Techniques (part 1)

Room: Renoir D

A Maneuverable, Configurable, Low Cost Sensor Deployment Platform 1399

Dale A Carnegie (Victoria University of Wellington, New Zealand)

James McVay (Victoria University of Wellington, New Zealand)

Surface Weather Observation via Distributed Devices 1405

Jane Louie Fresco Zamora (Nara Institute of Science and Technology, Japan)

Shigeru Kashiara (Nara Institute of Science and Technology, Japan)

Yuzo Taenaka (The University of Tokyo, Japan)

Suguru Yamaguchi (Nara Institute of Science and Technology, Japan)

Naoya Sawada (Nara Institute of Science and Technology, Japan)

Takemi Sahara (Nara Institute of Science and Technology, Japan)

Portable Airborne Data Acquisition for Flight Tests 1411

John W. Dyer (University of Oklahoma, USA)

Benjamin Douglas (University of Oklahoma, USA)

Yih-Ru Huang (University of Oklahoma, USA)

John E. Fagan (University of Oklahoma, USA)

11:00 - 12:45

S9E: Sensors and Sensor Fusion (part 2)

Room: Renoir E

Micromirror Array based optical spatial Filter Technique for fast and flexible Velocimetry 1416

Martin Degner (University of Rostock, Germany)

Hendrik Krüger (University of Rostock, Germany)

Hartmut Ewald (University of Rostock, Germany)

Indoor Positioning of Wheeled Devices for Ambient Assisted Living: a Case Study 1421

Payam Nazemzadeh (University of Trento, Italy)

Daniele Fontanelli (University of Trento, Italy)

David Macii (University of Trento, Italy)

Luigi Palopoli (University of Trento, Italy)

Relative Positioning System Using Inter-Robot Ultrasonic Localization Turret 1427

Andrei Stancovici (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)

Design and implementation of sensor data fusion for an autonomous quadrotor 1431

Matías Tallanián (Universidad de la República, Uruguay)

Santiago Paternain (Universidad de la República, Uruguay)

Rodrigo Rosa (Universidad de la República, Uruguay)

Rafael Canetti (Universidad de la República, Uruguay)

14:00 - 15:45

S10A: Signal & Image Processing Techniques (part 3)

Room: Conference Room

Performance Study of Digital Filters Applied to the Readout System of the Neutrinos-Angra Detector 1437

Tiago A. Alvarenga (Universidade Federal de Juiz de Fora, Brazil)

Tony I. Dornelas (Universidade Federal de Juiz de Fora, Brazil)

Dhiogo R. Esterce (Universidade Federal de Juiz de Fora, Brazil)

José A. de C. Vieira (Universidade Federal de Juiz de Fora, Brazil)

Rafael A. Nóbrega (Universidade Federal de Juiz de Fora, Brazil)

Robust Global Minimization of Active Contour Model for Multi-object Medical Image Segmentation 1443

Xuanping Li (Tsinghua University, P.R. China)

Xue Wang (Tsinghua University, P.R. China)

Yixiang Dai (Tsinghua University, P.R. China)

Morphological Analysis of Activated Sludge Flocs and Filaments 1449

Xue-Yong Lee (University Tunku Abdul Rahman, Malaysia)

Muhammad Burhan Khan (University Tunku Abdul Rahman, Malaysia)

Humaira Nisar (University Tunku Abdul Rahman, Malaysia)

Yeap Kim Ho (University Tunku Abdul Rahman, Malaysia)

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Qiang Wang (Harbin Institute of Technology, P.R. China)
Yipeng Liu (Harbin Institute of Technology, P.R. China)
Zhi He (Harbin Institute of Technology, P.R. China)

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Carmine Landi (Second University of Naples, Italy)
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Viviana Cigolotti (ENEA, Italy)

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Roberto Pisano (Politecnico di Torino, Italy)
Antonello A. Barresi (Politecnico di Torino, Italy)

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Tania Maria Ferla (Universidade Federal do Rio Grande do Sul, Brazil)
Guilherme Flach (Universidade Federal do Rio Grande do Sul, Brazil)
Ricardo Reis (Universidade Federal do Rio Grande do Sul, Brazil)

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Room: Cezanne

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P. Sallis (Auckland University of Technology, New Zealand)
X. Wang (Auckland University of Technology, New Zealand)

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Haitao Yu (Shanghai Institute of Microsystem and Information Technology, P.R. China)
Yanbo Ren (Shanghai Institute of Microsystem and Information Technology, P.R. China)
Pengcheng Xu (Shanghai Institute of Microsystem and Information Technology, P.R. China)
Xinxin Li (Shanghai Institute of Microsystem and Information Technology, P.R. China)

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Alessandro Andreani (Università degli Studi di Milano, Italy)

Alberto Annovi (INFN-LNF, Italy)

Roberto Beccherle (INFN- Sezione di Pisa, Italy)

Matteo Beretta (INFN-LNF, Italy)

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Valentino Liberali (Università degli Studi di Milano, INFN- Sezione di Milano, Italy)

Seyedruhollah Shojaii (Università degli Studi di Milano, INFN- Sezione di Milano, Italy)

Alberto Stabile (INFN- Sezione di Milano, Italy)

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Conrado Rossi-Aicardi (Universidad de la Republica & NanoWattICs, Uruguay)

Pablo Aguirre (Universidad de la República & NanoWattICs, Uruguay)

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Verônica Maria Lima Silva (Federal University of Paraiba, Brazil)

Antonio Augusto Lisboa de Souza (Federal University of Paraiba, Brazil)

Sebastian Yuri Cavalcanti Catunda (Federal University of Rio Grande do Norte, Brazil)

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José Abritta Costa (Federal University of Juiz de Fora, Brazil)

Tony Igor Dornelas (Federal University of Juiz de Fora, Brazil)

Augusto Santiago Cerqueira (Federal University of Juiz de Fora, Brazil)

Rafael Anutnes Nóbrega (Federal University of Juiz de Fora, Brazil)

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Mohsen Ferdowsi (RWTH Aachen University, Germany)

Artur Löwen (RWTH Aachen University, Germany)

Padraic McKeever (RWTH Aachen University, Germany)

Antonello Monti (RWTH Aachen University, Germany)

Ferdinanda Ponci (RWTH Aachen University, Germany)

Andrea Benigni (University of South Carolina, USA)

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Alejandro Gutiérrez (IMFIA-UdelAR, Uruguay)

Gabriel Cazes (IMFIA-UdelAR, Uruguay)

Santiago de Mello (UTE, Uruguay)

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Paolo Attilio Pegoraro (University of Cagliari, Italy)
Sara Sulis (University of Cagliari, Italy)
Ferdinanda Ponci (RWTH Aachen University, Germany)
Antonello Monti (RWTH Aachen University, Germany)

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Gonzalo Sotta (Universidad de la República, Uruguay)
Gabriel Eirea (Universidad de la República, Uruguay)
Julio Perez Acle (Universidad de la República, Uruguay)

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Viviana De Luca (Università degli Studi di Catania, Italy)
Salvatore Graziani (Università degli Studi di Catania, Italy)
Francesca Sapuppo (Università degli Studi di Catania, Italy)
Giovanna Di Pasquale (Università degli Studi di Catania, Italy)

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Emilio Silva (Escola Politécnica da Universidade de São Paulo, Brazil)

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Pedro Colla (Instituto Universitario Aeronáutico, Argentina)
Pablo Petrashin (Universidad Católica de Córdoba, Argentina)
Walter Lancioni (Universidad Católica de Córdoba, Argentina)
Luis Toledo (Universidad Católica de Córdoba, Argentina)

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<i>Shen Yi (Harbin Institute of Technology, P.R. China)</i>	

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<i>Fabio Coutinho (Universidade Tecnológica Federal do Paraná, Brazil)</i>	
<i>Raquel Rasia (Universidade Tecnológica Federal do Paraná, Brazil)</i>	
<i>Lúcia Valeria Ramos de Arruda (Universidade Tecnológica Federal do Paraná, Brazil)</i>	
<i>Flavio Neves Jr. (Universidade Tecnológica Federal do Paraná, Brazil)</i>	
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<i>Guilherme Dutra (Universidade Tecnológica Federal do Paraná, Brazil)</i>	
<i>Rigoberto Morales (Universidade Tecnológica Federal do Paraná, Brazil)</i>	
<i>Cicero Martelli (Universidade Tecnológica Federal do Paraná, Brazil)</i>	
<i>Marco Jose Da Silva (Universidade Tecnológica Federal do Paraná, Brazil)</i>	

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Joan Albesa (University of Freiburg, Germany)

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Room: Conference Room

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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)

Marius Cordea (Mgestyk Technologies, Canada)

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Leiva Casemiro Oliveira (Universidade Federal de Campina Grande & Universidade Federal Rural do Semi-árido, Brazil)

Fernanda Loureiro (Universidade Federal de Campina Grande, Brazil)

Antonio Marcus Nogueira Lima (Universidade Federal de Campina Grande & Center for Electrical Engineering and Informatics, Brazil)

Helmut Neff (Federal University of Campina Grande, Brazil)

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Luca Fasanotti (Intellimech Consortium, Parco Scientifico tecnologico Kilometro Rosso, Italy)

Marco Tomasini (Intellimech Consortium, Parco Scientifico tecnologico Kilometro Rosso, Italy)

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Paolo Carbone (University of Perugia, Italy)

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Stefano Neri (Società delle Fucine SrL, Italy)

Renato Borgna (Società delle Fucine SrL, Italy)

Manuelo Peppucci (Società delle Fucine SrL, Italy)

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Michela Borghetti (University of Brescia, Italy)

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Welcome Message from the Chairpersons

On behalf of the organizing, technical and local committees of IEEE International Instrumentation and Measurement Technology Conference (I2MTC 2014), we welcome you to Montevideo. Here in Uruguay we are all concerned with sustainable development, and so it has been chosen as the theme of the conference. Our excellent and broad technical program covers the traditional span of instrumentation and measurement fields, and reflecting the main theme, the program also contains many sessions dealing with issues related to it.

As usual, we start with a full day of tutorials offering more than a dozen fascinating topics. We have three esteemed keynote speakers who set the tone for the three days of the conference which consists of five parallel tracks of oral and one track of poster presentations. They are Dr. Pasquale Arpaia, from the CERN, Dr. David Leibrandt from NIST and the recipient of the IEEE 2014 Keithley Award, Thomas Linnenbrik. We appreciate and we are very much thankful to them for coming and sharing their knowledge and experiences with us.

This is the first time the IMTC Conference is held in Latin-America and in the southern hemisphere as well. Our local chapter, one of the few and oldest IMS Chapters in Region 9, is very, very happy and proud of making history and hosting this Conference. Most appropriately, this year also marks the silver anniversary of the Uruguayan Section, and for our volunteers this Conference is the most significant part of the Celebration activities.

It is with a great satisfaction that we are honored to receive in our Country the presence of so many scientists and engineers from all over the world. Enjoy Montevideo; it is a nice city that strongly conserves its Spanish and European heritage. Just in front of the Conference hotel –which was built in the 50's and enlarged later– is the main square, with the old and the new President's houses, and the very nice, 160 years old, "Solis Theater" which bears the name of the Spanish ship captain that discovered our land. You will find the old city through the gate of the Citadel, the fort that protected the port and the old city that lies to the west. We also encourage you to visit the country.

Again, welcome, and please do enjoy the Conference and your stay.

Juan Carlos Miguez, General Chair



Daniel Slomovitz, Technical Chair



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I²MTC 2014 Keynote Speakers

Pasquale Arpaia

*European Organization for Nuclear Research (CERN), Geneva, Switzerland
University of Sannio, Benevento, Italia*



Keynote Tuesday, May 13, 2014

"Beyond the Higgs boson hunting: high-performance instrumentation and measurement technologies for testing and tuning particle accelerators at CERN"

David R. Leibrandt

National Institute of Standards and Technology, USA



Keynote Wednesday, May 14, 2014

"Optical atomic clocks - measurement at the 17th decimal place"

Thomas Linnenbrink

*2014 Keithley Award Winner
Teqovations, LLC, USA*



Keynote Thursday, May 15, 2014

"Realizing the Inherent Performance of Modern ADCs in Real Systems"

I²MTC 2014 Conference Sponsors



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UTE is a company of the Uruguayan State, which generates, transmits, distributes and commercializes electrical energy throughout the country. Its purpose is to work for the electric service within a framework of economic, social and environmental sustainability, to reach all households and activities of the country, reliably, with a level of quality that satisfies our society and at the lowest price possible.



30 years generating energy and linking two nations The Joint Technical Commission of Salto Grande is a binational organization created by Argentina and Uruguay in order to make necessary modifications to the use of the Uruguay river rapids in the Salto Grande.

Since its inception, it was responsible for studies and projects and later the construction and commissioning of the Salto Grande Hydroelectric Complex, which was the first hydraulic binational and multi-purpose facility in Latin America.

Our Mission is producing and supplying electrical energy through the use of the Uruguay River and the effective administration of the Salto Grande Hydroelectric Complex, preserving the environment, contributing to socioeconomic development and integration of Argentina and Uruguay.

Our Vision is to be a reliable, transparent and sustainable organization, a leader in the efficient supply of clean energy, recognized in the community and formed by a team of workers who are proud of belonging.



The National Research and Innovation Agency (ANII) is a Uruguayan government entity that promotes and encourages research and application of new knowledge to the productive and social realities.

Its most important goal is to be a key player in the continuous process of developing an equitable society. It is an agent of change, with a unique vision of driving Uruguay's productive and social development in such areas as science, technology, quality of work, social inclusion, and business innovation.

Its role is to promote and support the successful exchange between authorities, entrepreneurs and the research community. Provide funding, sustainment and the necessary tools required for building new business undertakings and projects. Act as the link between public and private organizations, coordinating and actively promoting dialog and generating productive guidelines among ministries, universities, business enterprises and social organizations.

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With over 50 years in the area of test and measurement instrumentation, Coasin Instruments SA attends day to day needs of the scientific and technological communities of the country, promoting and giving support to premium brands.

I²MTC 2014 Exhibitors



La energía que nos une

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**IEEE Instrumentation and Measurement Society
Outstanding Young Engineer Award**

The I&M Outstanding Young Engineer Award recognizes an outstanding young I&M member who has distinguished him or herself through achievements, which are technical, of exemplary service to the I&M Society, or a combination of both, early in their career. The nominee must not have reached their 39th birthday and must be an I&M member at the time of nomination.

The 2013 Outstanding Young Engineer Award recipient is:



Mohammad Tayeb Ghasr

*Missouri University of Science and Technology
USA*

"For outstanding contributions to real-time microwave imaging and nondestructive testing systems development."

Mohammad Tayeb Ghasr (S'01 - M'10 – SM'12) received his B.S. in electrical engineering degree (*Magna Cum laude*) from the American University of Sharjah (AUS), Sharjah, in 2002 and his M.S. degree in electrical engineering from the University of Missouri-Rolla, Rolla, in 2004 and the Ph.D. degree in electrical engineering from Missouri University of Science and Technology (Missouri S&T), MO, USA in 2009.

Currently, he is an Assistant Research Professor with the Applied Microwave Nondestructive Testing Laboratory (*amntl*), Electrical and Computer Engineering Department, Missouri University of Science and Technology (Missouri S&T). He has over 85 journal papers, conference proceedings and presentations, and technical reports. He has nine awarded and pending patents to his credit. His research interests include microwave and millimeter-wave instrumentation and measurement, RF circuits, antennas, and numerical electromagnetic analysis. He is a recipient of the 2013 H. A. Wheeler Prize Paper Award of the IEEE Antennas and Propagation Society.

**IEEE Instrumentation and Measurement Society
Technical Award**

The I&M Technical Award is given to an individual or group of individuals for outstanding contribution or leadership in advancing instrumentation design or measurement technique.

The 2013 Technical Award recipient is:



Robert X. Gao
University of Connecticut
USA

“For significantly advancing the state-of-the-art in electrical capacitance tomography instrument design.”

Robert Gao received his Ph.D. from the Technical University of Berlin, Germany, in 1991. His research aims to improve the observability of dynamical systems and processes for better understanding of the underlying physics and better control. Topics of his research include sensing methodology, design and characterization of instrument systems, multi-resolution analysis for time series and image processing, and energy-efficient sensor networks, with applications in health care, cyber physical systems, and intelligent manufacturing.

He has developed graduate courses on mechatronics and advanced measurement systems, and supervised over 40 Ph.D./M.S. students and postdocs. He is a PI/Co-PI of over 55 federal and industry-sponsored projects, a co-author/co-editor of two books and over 280 refereed journal and conference papers, and holds four patents.

Dr. Gao was an Associate Editor for the *IEEE Transactions on Instrumentation and Measurement* (2000–2008 and 2010–2013) and *Journal of Dynamic Systems, Measurement, and Control* (2005–2008) of the American Society of Mechanical Engineers (ASME). Currently he is an Associate Editor for the ASME *Journal of Manufacturing Science and Engineering*, and *Mechatronics*, a journal of the International Federation of Automatic Control (IFAC). He was a Distinguished Lecturer of the *IEEE Electron Devices Society* (2008–2013). His awards include the *Instrumentation and Measurement Society’s* Technical Award (2013) and Outstanding Associate Editor Award (2012), the *US National Science Foundation CAREER* Award (1996), and several Best Paper/Best Student Paper awards. He is a Fellow of the IEEE and ASME, and an elected Member of the Connecticut Academy of Science and Engineering (CASE).

**IEEE Instrumentation and Measurement Society
Career Excellence Award**

The I&M Society Career Excellence Award is awarded to recognize a lifetime career of meritorious achievement and outstanding technical contribution by an individual in the field of instrumentation and measurement.

The 2013 Career Excellence Award recipient is:



Massimo D'Apuzzo
Universita' di Napoli Federico II
Italy

"For lifelong activity and outstanding achievement in pioneering the use of microcontrollers in electrical measurements."

Massimo D'Apuzzo has been Full Professor of Electrical and Electronic Measurements since 1986. He is currently affiliated with the Dept. of Electrical Engineering and Information Technologies of the University of Naples Federico II, Italy.

Massimo D'Apuzzo carried out a proficuous and intense scientific activity in the area of Instrumentation and Measurement. He has headed research groups involved in the research activities in the field of general metrology, as well as in the definition, design and experimental validation of innovative methodologies for the characterization and performance assessment of dynamic systems, analog-to-digital converters and transducers. His most innovative and influencing scientific contributions are referred to three themes: (i) use of microprocessor for measurements on electrical systems, (ii) automatic instrument fault detection and isolation and (iii) power measurement on wireless communication systems. Massimo D'Apuzzo has been academic tutor and scientific mentor of several PhD fellows and collaborators, most of whom are now leading academics of Electrical and Electronic Measurements in prestigious Italian universities or occupy managing positions in industrial companies. He has founded and is Director of the Center for Advanced Metrology Services of the University of Naples Federico II.

He was President of the Italian Group of Electrical and Electronic Measurements, Head of the Department of Electrical Engineering of the University of Naples Federico II, member of the Academic Senate and President of the Scientific and Technological School of the same University.

2013 I&M Society Fellows

Mohammad Alam

University of South Alabama

Mobile, AL, USA

“For contributions to pattern recognition and high resolution image reconstruction.”

Kim Fowler

Kansas State University

Manhatta, KS, USA

“For contributions to mission-critical and safety-critical systems engineering.”

2013 I&M Society Senior Member Elevations

Mudrik Alaydrus

Karl Anderson

Bruno Ando

Mohsen Ashourian

Mohammad Fazle Azeem

Keshav Bapat

Raja Boddu

Gopi Bulusu

Andrea Cataldo

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Juha Kostamovaara

Navneet Kothari

Cheryl Liss

Narendra Londhe

Don Martin

Erick Maxwell

Mart Min

Gerardo Miramontes De Leon

Vincenzo Paciello

Nicola Pasquino

Pedro M Ramos

Arun Rau

David Rick

Sergio Saponara

Peter Silbermann

Andrew Street

Laszlo Sujbert

Linas Svilainis

Chen Xiyuan

I²MTC Tradition

The first *IEEE Instrumentation and Measurement Technology Conference* was held in 1984 aboard the Queen Mary in Long Beach, California, but its origins stretch back nearly 20 years earlier to the *Electrical and Electronic Measurement and Test Instrument Conference* held each year from 1966 until 1981 in Ottawa, Canada. The latter was revived by the IEEE Instrumentation and Measurement Society with a new focus on all aspects of instrumentation and measurement. The following list contains locations and themes of the I²MTC conferences:

- 1984 – Long Beach, CA, USA, *Automation-Quality-Productivity*
- 1985 – Tampa, FL, USA, *Measurement Science*
- 1986 – Boulder, CO, USA, *Standards of Excellence*
- 1987 – Boston, MA, USA, *The Changing Face of I&M Technologies*
- 1988 – San Diego, CA, USA, *Intelligence in Instrumentation*
- 1989 – Washington, DC, USA, *Persuasive I&M Technology – A Resource*
- 1990 – San Jose, CA, USA, *Emerging Measurement Technologies*
- 1991 – Atlanta, GA, USA, *Enhancing Productivity with Instrumentation and Measurement Technologies*
- 1992 – Meadowlands, NJ, USA, *Smart People, Smart Instruments, Smart Measurements*
- 1993 – Irvine, CA, USA, *Innovative Ideas for Industry*
- 1994 – Hamamatsu, JAPAN, *Advanced Technologies in Instrumentation and Measurement*
- 1995 – Waltham, MA, USA, *I3C – Integrating Intelligent Instrumentation and Control*
- 1996 – Brussels, BELGIUM, *Quality Measurements – The Indispensable Bridge between Theory and Reality (No Measurements? No Science!)*
- 1997 – Ottawa, CANADA, *Sensing, Processing, Networking*
- 1998 – St. Paul, MN, USA, *Where Instrumentation is Going*
- 1999 – Venice, ITALY, *Measurements for the New Millennium*
- 2000 – Baltimore, MD USA, *Smart Connectivity: Integrating Measurement and Control*
- 2001 – Budapest, HUNGARY, *Rediscovering Measurement in the Age of Informatics*
- 2002 – Anchorage, AK, USA, *The Frontier of Instrumentation and Measurement*
- 2003 – Vail, CO, USA, *Instrumentation and Measurement at the Summit*
- 2004 – Lake Como, ITALY, *From the Electrometer to the Networked Instruments: A Giant Step toward a Deeper Knowledge*
- 2005 – Ottawa, CANADA, *The 22nd Reunion*
- 2006 – Sorrento, ITALY, *A View on the New Technologies for Instrumentation and Measurement*
- 2007 – Warsaw, POLAND, *Synergy of Science and Technology in Instrumentation and Measurement*
- 2008 – Victoria, British Columbia, CANADA, *Advances in the Science of Measurement Technology*
- 2009 – Singapore, *Always On: Instrumentation and Measurement in the Networked World*
- 2010 – Austin, TX, USA, *Innovative and Integrated Applications of I&M*
- 2011 – Binjiang, Hangzhou, CHINA, *Instrumentation and Measurement for Improving Quality of Life*
- 2012 – Graz, Austria, *Smart Measurements for a Sustainable Environment*
- 2013 – Minneapolis, MN, USA, *Instrumentation and Measurement for Life*

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The "Measurable" of Tomorrow:
Providing a Better Perspective on Complex Systems



2
IMTCTM **2015 IEEE**
International Instrumentation
and Measurement Technology
Conference

MAY 11 - 14, 2015
PISA, ITALY

I²MTC 2015 spans research, development and applications in the field of instrumentation and measurement science and technology. This includes Industrial Tracks, where research merges with practical applications in industrial technology used every day. The Conference fosters the exchange of know-how between industry and academia. Paper contests will include a Conference Best Paper Award and Student Best Poster Awards. In addition to papers, the conference will also have Tutorials and Exhibits covering the entire range of Instrumentation and Measurement Technology. The Conference focuses on all aspects of instrumentation and measurement science and technology-research, development and applications. The program topics include:

- Advances in Instrumentation and Measurement Developments and Techniques
- Biomedical Systems
- Data Acquisition Systems and Techniques
- Energy and Power Systems
- Industrial Process Control
- Measurement and Instrumentation for Industrial Applications
- Measurement Applications
- Measurement of Electric and Magnetic Quantities
- Measurement of Materials and Mechanical Quantities
- Measurement, Instrumentation and Methodologies Related to Healthcare Systems
- Measurement Systems and Theory
- Non-invasive Measurement Techniques and Instrumentation
- Real-Time Measurement
- Robotics and Controls
- Sensors and Sensor Fusion
- Signal & Image Processing Techniques
- Software Development for Measurement and Instrumentation Support
- Techniques related to Instrumentation
- Transducers
- Virtual Measurement Systems
- Wireless Sensors and Systems

IMPORTANT DATES

September 15, 2014 - Submission of FULL PAPERS (**HARD Deadline**)

December 05, 2014 - Notification of paper acceptance, rejection or revision

January 12, 2015 - Submission of final version (**HARD Deadline**)

February 9, 2015 - Final notification of paper acceptance

Given that the 2015 conference's theme is "**The "measurable" of tomorrow: Providing a Better Perspective on Complex Systems**", we strongly encourage submissions in the areas of instrumentation and measurement for energy, transportation and communication systems.

Prospective Authors are invited to submit a FULL PAPER of typically 4-5 (maximum 6) pages IEEE format consisting of a complete description of the proposed technical content and applicable research results. Each paper should indicate appropriateness for the scope of the Conference, originality and quality of the technical content, whole organization and writing style. The paper should, moreover, explain the significance of the contribution and contain a list of key references. It must be prepared according to the paper preparation guidelines provided on the I²MTC website. In case of revision, papers are accepted only upon condition that the changes requested by the Reviewers are satisfactorily addressed by the Authors in the final submitted papers. Final papers may be rejected if the Reviewers' remarks have not been properly addressed.

Papers presented at the conference will be published in the Conference Proceedings and via IEEE Xplore, reporting the following statement on each page: "The complete technical content of this paper was peer reviewed at the direction of IEEE I&M Society subject matter experts". A Student Poster Contest will be held for both graduate and undergraduate student papers, with cash awards for the best papers. Papers should be submitted by the students according to the rules posted on the website and should be identified as student papers. Check the website for detailed instructions and deadlines.

Special Sessions will provide a comprehensive discussion of specific challenging and emerging issues in the instrumentation and measurement area. Special Session organizers should submit their proposals within 10 August 2014.

Student Travel Awards will be made available. Check the website for detailed instructions, application, and deadlines.

Authors of accepted papers must register for the Conference and attend to present their papers. The authors of papers presented during I²MTC 2015 will be allowed to submit expanded and extended versions of their papers to the Special Issue of IEEE Transactions on Instrumentation & Measurement on I²MTC 2015 to be published in 2016.

2015.imtc.ieee-ims.org

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Tutorials - Monday, May 12

Session 1

09:00 - 10:30

Room: Conference Room

How to model measurement activity and define uncertainty

Alessandro M Ferrero (Politecnico di Milano, Italy)

Room: Gauguin

Biomedical instrumentation amplifiers

Alfredo Arnaud (Electrical Engineering Department at Universidad Catolica del Uruguay, Uruguay)

Room: Renoir E

Advanced Sensors and Instrumentation

Subhas Mukhopadhyay (Massey University, New Zealand)

Session 2

11:00 - 12:30

Room: Conference Room

Measurement Uncertainty Quantification

Daniel Watzenig (Graz University of Technology, Austria)

Room: Gauguin

Noise measurements in electronic devices

Fabien Pascal (Institut d'Electronique du Sud (IES laboratory), France)

Room: Renoir D

New developments in the field of atmospheric monitoring

Erna Frins (Instituto de Física, Facultad de Ingeniería, Universidad de la República, Uruguay)

Room: Renoir E

Reliable Flow Measurement

Anton Fuchs (Graz University of Technology & Virtual Vehicle, Austria)

Session 3

2:00 - 3:30

Room: Conference Room

Methodology of Measurement

Dario Petri (Department of Industrial Engineering, University of Trento, Italy)

Room: Gauguin

Noise in Classical and Quantum Measurements

Fabio da Silva (National Institute of Standards and Technology, USA)

Room: Renoir D

Advances in Microwave Materials Characterization for NDT of Complex Structures: Theory, Methods, and Applications

Kristen M. Donnell (Missouri University of Science and Technology, USA)

Room: Renoir E

Temperature Sensors: From sense of touch towards smart dust

Conrado Rossi-Aicardi (Universidad de la Republica & NanoWattICs, Uruguay)

Session 4

4:00 - 5:30

Room: Gauguin

Blind Signal Identification for Emerging Intelligent Radio Systems

Octavia Dobre (Memorial University of Newfoundland, Canada)

Room: Renoir D

Alkali atoms at the heart of photonic devices

Horacio Failache (Instituto de Física, Facultad de Ingeniería, Universidad de la Republica Uruguay)

Room: Renoir E

CMOS-based microsystems for biomedical applications

Diego Barretino (University of Applied Sciences of Southern Switzerland (SUPSI), Switzerland)