

# **IMTC/2007®**

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## **2007 IEEE Instrumentation and Measurement Technology Conference Proceedings**

**Synergy of Science and Technology in Instrumentation and Measurement**

**Warsaw Marriott Hotel, Warsaw, Poland, May 1-3, 2007**

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# *IM*<sub>TC/2007</sub><sup>®</sup>



**2007 IEEE Instrumentation and Measurement Technology  
Conference Proceedings  
*Synergy of Science and Technology in Instrumentation and  
Measurement***

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## Welcome Message

**Roman Z. Morawski, IMTC 2007 Chair**

Dear Participants and Guests of IMTC 2007!



It is with great pleasure that I welcome you to Warsaw, the capital of Poland. We are here for the 24th IEEE Instrumentation and Measurement Technology Conference IMTC 2007 – an annual international meeting of experts in the field of measurement science, technology and applications. The theme of this edition of IMTC is *Synergy of Science and Technology in Instrumentation and Measurement*. It has been chosen to emphasize a particular importance of the consolidation of scientific and technological efforts in the domain of measurement and instrumentation. On the one hand, there is nothing more practical for the development of new methods and techniques of measurement than a good theory; on the other – the practical implementation of the best methods and techniques of measurement is unthinkable without adequate technological means referring to new materials and sophisticated manufacturing processes. The theme of IMTC 2007 has been also chosen in reference to the best traditions of the Polish academic milieu in the development of scientific fundamentals of instrumentation and measurement.

After IMTC 2001, held in Budapest, IMTC 2007 is the second flag-ship conference of the IEEE Instrumentation and Measurement Society held in a country of Central Europe which 18 years ago regained its political sovereignty after a 50-year-long trauma of totalitarian regimes, in a country that despite that historical experience has never lost its intellectual and spiritual identity. Warsaw, a capital of this country, is today an exciting venue: a city full of history and cultural institutions, well known also for its establishments of performing arts and gastronomy. Warsaw is today an ideal setting, not only for discussing new developments in research and engineering, but also for meeting old friends and new colleagues from all over the world in a congenial and relaxing atmosphere.

The IMTC 2007 technical program has been composed of carefully selected items: ca. 450 oral and poster presentations of high-quality papers, selected out of ca. 700 submissions received from all over the world. The selection was based on the results of a peer review process accomplished in a very disciplined way by the members of the IMTC 2007 Technical Program Committee. The technical program of IMTC 2007 encompasses a number of important events and activities. It will be opened by Ryszard S. Jachowicz with a keynote lecture entitled *MEMS in metrology, metrology in MEMS*. According to the IMTC tradition, the conference program has been structured in several parallel tracks of both oral and poster sessions, scheduled in such a way as to avoid overlapping of sessions on related topics. A number of special sessions have been solicited, organized, and will be chaired by well-known scholars from international industrial and academic milieus.

On behalf of the IMTC 2007 Executive Committee, I wish to thank the authors for submitting their papers and sharing their scientific findings with the international instrumentation-and-measurement community. This conference would not have been possible without the tireless efforts of the special session organizers, and the



invaluable dedication of the reviewers who are the cornerstone of any technically sound program. I would like to thank them all for their work, especially for their comments and suggestions that enabled the IMTC 2007 Technical Program Chairs to choose the best papers, and helped the authors to further improve the quality of their contributions. Taking advantage of this opportunity, I would also like to acknowledge the organizational support of some Polish institutions. First of all, I would like to thank the authorities of Warsaw University of Technology who kindly accepted and supported the functioning of the IMTC 2007 Executive Committee at its three organizational units: Faculty of Electronics and Information Technology, Faculty of Electrical Engineering, and Faculty of Physics. Next, I would like to acknowledge the support of the authorities of Gdynia Maritime University, and of Military University of Technology. The organization of such a reputable, large event as IMTC 2007 has been a complex task. I would like to take this opportunity to thank my colleagues, members of the IMTC 2007 Executive Committee, for their volunteer efforts that have made possible the accomplishment of this task.

Dear Participants and Guests of IMTC 2007!

The Conference is about to begin. You are now in a position to enjoy the fellowship of colleagues and experts and to pass free time in a new exciting environment. I wish you a very nice stay in Warsaw and beneficial participation in the Conference. Let it be a success!

## Keynote lecture



The invited IMTC 2007 keynote lecture

# ***MEMS in metrology, metrology in MEMS***

by

**Ryszard S. Jachowicz**

**Warsaw University of Technology**

**Poland**

The demand for measurements is as old as human civilizations. At their very beginning, measures were very primitive: day, half a day – for time interval; foot, stadium – for length or distance. During centuries, many measurement units have been established, and many metrological tools or metrological systems have been developed. However, the most significant progress in this domain has been achieved during the XXth century. By the end of that century, it was not a problem, in most of cases, to accurately measure any particular physical or chemical quantity. The problem was rather related to manufacture measurement systems in high volume: the pressure appeared to produce them cheaper, and at the same time to make them more reliable, more stable in time and more repeatable.

Specialized microsystems, developed for many physical or chemical quantities, meet all those requirements very well in many cases, such as acceleration sensors, gyroscopes or pressure sensors. Microsystems for some other applications have a great potential to meet those requirements. The operational power of microsystems is mostly related to the integration of four devices important for any measurement system: a sensor (or a sensor matrix), a unit of control and advanced signal processing, an actuator (or an actuator matrix) and an interface to an outer system – all on a single chip. This is possible due to the advancements of micro- and nanotechnology, and in particular to the development of microsystems labeled with the acronyms MEMS (Micro Electro Mechanical Systems) and MOEMS (Micro Opto Electro Mechanical Systems). The progress in the domain of above-mentioned technologies enabled the design of micromechanical devices – actuated by electrostatic, thermal or piezoelectric means – whose response time is in the range of microseconds or milliseconds, and whose energy consumption is very small.

The IMTC 2007 keynote lecture is intended to present a review of the newest advancements of microsystem technology for measurement applications. A broad overview of many newest developments in MEMS technology will be discussed: microgyroscopes, atomic force microscope sensors, microsystems for medical applications, artificial ears and eyes, labs on a chip, MEMS frequency standards, microspectrometers, and many others.

During the manufacturing of various MEMS, very often it is necessary to test their geometry, mechanical or material parameters. In particular, some linear dimensions, deflections, stress distributions, heat transfer and temperature distributions are important for MEMS structure validation or improvement. Some examples of measurement techniques for microscale will be also demonstrated and discussed in the IMTC 2007 keynote lecture.

## **Plenary Poster Session**

The Plenary Poster Session is scheduled for May 2, 2007, 4:00-5:30PM. The program of this session includes papers which by nature are predestined for poster presentation and which may attract general interest due to the topics they refer to. During the session, wine and cheese will be offered to the attendees.

### **Panel Discussion - *Extending the Frontiers of Space Measurement***

The panel discussion will be part of the Special Session *Space – Frontiers of Measurement* scheduled for May 3, 2007, 4:00-5:30PM. It will be facilitated by Brian C. Wadell (Maxim Integrated Products, USA), John Schmalzel (Rowan University/NASA Stennis, USA), Kim Fowler (CoolStream, USA) and Reza Zoughi (University of Missouri-Rolla, USA).

Abstract: There is a resurgence in space exploration activity. In 2004, the US announced plans to return to the moon by 2020. Supporting this new mission requires a new generation of launch and exploration vehicles. Recently, China's space program has placed astronauts into orbit and is planning crewed lunar exploration missions by the end of the next decade. The remarkable photographs returned by the Mars rovers and the longevity of the rovers have underscored the promise of autonomous exploration vehicles. Rutan's company, Scaled Composites, won the X Prize in 2004; we may be on the brink of a new wave of commercial and tourist access to space. Panelists will provide brief position statements amplifying the unique aspects of their work as they relate to significant challenges of measurements in support of space exploration. The discussion led by the panel will explore the ramifications for the measurement community. During the remaining portion of the session, panelists and session attendees will discuss mechanisms for furthering technical interchange at future conferences and workshops.

### **Informal Discussion and Reception - *Women in Engineering***

This event – scheduled for May 1, 2007, 3:30-5:30PM (room Sawa) – will be facilitated by Ruth A. Dyer (Kansas State University, USA). It will provide an informal networking opportunity for women scientists and engineers in academe, industry, and government. Anyone interested in promoting greater involvement of women in the I&M Society also will be welcome. Members of the Instrumentation and Measurement (I&M) Society Administrative Committee will attend and participate in the discussion. Attendees will have the opportunity to meet new colleagues, as well as share ideas and strategies with one another regarding career advancement. Topics that will be addressed include opportunities for greater involvement in the I&M Society; similarities and differences in the university and other workplaces in various countries and what we can learn from one another's experiences; importance of mentoring and cultivating a circle of mentors; and suggestions from the participants as to how the I&M Administrative Committee can engage more women members and use their talents to enhance the I&M Society.



# IMTC 2007 Tutorials

## Tutorials

The IMTC 2007 tutorials are scheduled for April 30, 2007 (Monday), 8:30AM – 6:00PM (with time off for lunch). They will be held in the conference rooms of the Warsaw Marriott Hotel and in the lecture rooms of Warsaw University of Technology located nearby. They will provide concentrated instruction in selected fields of instrumentation and measurement.

***T1: ADC and DAC Architectures, Calibration, and Test***

FANG XU, Teradyne Inc., USA

8:30AM – 12:00AM, room Wars

***T2: Data Acquisition and Fundamentals of Sensors***

John SCHMALZEL, Rowan University/NASA Stennis, USA

8:30AM – 12:00AM, room Sawa

***T7: Metrology, Measurement Principles, Measurement Uncertainty***

Alessandro FERRERO, Politecnico di Milano, Italy

1:30PM – 4:30PM, room Wars

***T8: Networked and Distributed Measurement Systems***

Kang B. LEE, National Institute of Standards and Technology, USA

1:30PM – 4:30PM, room Sawa

## Technical Visits

On May 4, 2007, the IMTC 2007 participants are kindly invited to visit two research laboratories at the Faculty of Electronics and Information Technology, Warsaw University of Technology. The tours of the Laboratory of Flow Measurements (room #018) will be guided by Grzegorz Pankanin from 10:00 AM to 12:00 noon. The tours of the Electronics Laboratory of High-Energy Physics (room #603B) will be guided by Tomasz Czarski from 10:00 AM to 5:00 PM. Both laboratories are located in the building of the Faculty (indicated on the IMTC 2007 map provided in the section VENUE of the IMTC 2007 website).

## Awards and Distinctions

### Instrumentation and Measurement Society Award

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

The 2006 Society Award recipient is:



**Mel Siegel**, Carnegie-Mellon University, School of Computer Science, Robotics Institute, Pittsburgh, Pennsylvania, USA.

*“For dedicated service to the I&M Society as Treasurer and for leadership as Co-Chair of TC-22, TC-27, TC-28 and TC-30.”*

Mel Siegel did his undergraduate work at Cornell University and his graduate work, leading to the PhD under Nobel Laureate John L. Hall at the University of Colorado - Boulder. He is currently a faculty member in the Robotics Institute, School of Computer Science, Carnegie Mellon University, where he is the founding director of the Sensors, Measurement, and Control Lab. His previous employment includes service in the US Peace Corps teaching physics and mathematics in Ghana, a post-doc at the University of Virginia, a professorship at the State University of New York - Buffalo, and an eight-year foray into industry with the specialty mass spectrometer system manufacturer Extrel, where he directed research, development, and applications. At the Robotics Institute he and his students and colleagues conduct research at all levels of sensor and measurement science, from devices to instruments to systems to advanced sensor fusion software. His interest in the human-machine interaction aspect of robotics led also to substantial contributions to the field of three dimensional display systems, including innovations for which several patents have been issued. At the robotics theory level, Mel has recently been studying energy and communication scaling issues, focusing especially on systems made up of very large numbers of very small sensor-carrying robots. In addition to teaching courses in Sensing and Sensors regularly and Electromechanical Systems occasionally, Mel runs a professional masters degree program – Master of Science in Information Technology / Robotics Technology – with a distance education component that is part of Carnegie Mellon’s internationalization effort. He is a Fellow of the IEEE, and is currently Treasurer of its Instrumentation and Measurement Society.

## Instrumentation and Measurement Society Distinguished Service Award

The I&M Society Distinguished Service Award is presented each year to an individual who has given outstanding service to the Society and to the profession.

The 2006 Distinguished Service Award recipient is:



**Brian C. Wadell**, Maxim Integrated Products, Reading, Massachusetts, USA

*"For outstanding contributions in 15 years of membership on the Society Administrative Committee and for serving two terms as President of the I&M Society."*

Brian C. Wadell graduated with a B.S.E.E. in 1981 and a M.Eng. in 1982 from Cornell University. Although convinced after graduation that he would work with the budding digital audio industry, early high frequency projects expanded into a career using his DSP, software, and analog design knowledge in microwave instrumentation, transmission lines, and signal integrity.

Mr. Wadell's career began with 12 years at Teradyne, Inc. where he designed the analog pin electronics for the first production tester of CCD image sensors used in consumer camcorders. He architected the first DSP-based vector network analyzer (VNA) which included internal calibration standards, modulation, and source/measure capabilities per pin. While at Teradyne Mr. Wadell and his colleague, Dan Rosenthal, developed statistically-based techniques to predict and eliminate intermittent failures in large ATE testers resulting in large savings of both time and effort for the company. After Teradyne, Mr. Wadell started Guided Wave Solutions which consulted in the area of signal integrity, interconnects, and wrote microwave test software including the self-test software for the microwave test rack of the B-2 bomber. In 1997 Mr. Wadell joined Trakus, a Boston startup, as V.P. Hardware Engineering, and later CTO, where he led the development of a microwave spread spectrum system used to track and measure the motion of hockey players in real time for sports broadcasts. This system won the Popular Science Top 100 Technologies of 2000 award and was demonstrated live during NHL games. Later projects developed instrumentation hardware and software for auto-racing, golf, and the Marathon.

Brian is now a Strategic Planner at Maxim Integrated Products where he develops integrated circuits for handheld consumer products.

Mr. Wadell is the author of the popular Transmission Line Design Handbook, he has been granted four patents in the areas of microwave packaging, VNA architecture, and sports tracking.

Mr. Wadell has been an active member of the IEEE since his student chapter days where he helped prevent the Architecture School's Dragon from entering the Engineering Quad. He has been active in the IEEE Boston Chapter of I&M as IM Chapter Chairman, co-chairman of IMTC '96, and instructor of the course "Practical Transmission Line Design in High Speed Systems." He has been active as a member of the Instrumentation and Measurement Society AdCom for 15 years including terms as Treasurer, VP Finance, two terms as President and where he currently serves as Senior Past President and Chair of the AdHoc Committee on Society Management. He was elected IEEE Fellow in January 2003.

Brian enjoys woodworking, backpacking and mountaineering, and is finally learning to play the piano. He has been certified by SOLO as a Wilderness First Responder, and has level I

and II Avalanche Certification. Most of all he enjoys spending his free time with his wife Valerie, and his daughter, Hailey Grace.

### **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/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 39<sup>th</sup> birthday and must be an I&M member at the time of nomination.

The 2006 Outstanding Young Engineer Award recipient is:



**Wendy Van Moer**, Vrije Universiteit Brussel, Brussels, Belgium  
*"For outstanding contributions to nonlinear circuit theory."*

Wendy Van Moer (M'97-SM'07) was born in 1974 in Belgium. She received the engineering degree in telecommunication and doctoral degree in applied sciences from the Vrije Universiteit Brussel (VUB), in 1997 and 2001, respectively.

In 1997 she received a research grant of the Institute for the promotion of innovation by science and technology in flanders (IWT). In 2002, she received a post-doctoral research grant of the same institute. She has won Best Paper Awards for ARFTG in 1999, 2000, 2001, 2005, and 2006.

She is currently a part-time lecturer and post-doctoral researcher with the Electrical Measurement Department (ELEC), at the Vrije Universiteit Brussel. Her main research interests are nonlinear microwave measurement and modeling techniques.

Ms. Van Moer has been a member of the IEEE since 1997 and was awarded Senior Member status in 2007. She has served on numerous Program Committees organizing sessions for IMTC. Ms. Van Moer is a reviewer for I&M Transactions and MTT Transactions as well as IMTC, MTT, ICT, and EUMC and NIST internal reviews.

## Instrumentation and Measurement Society Career Excellence Award

The I&M 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 2006 Career Excellence Award recipient is:



**J. Barry Oakes**, Retired, Sykesville, Maryland, USA

*"For outstanding contributions to the I&M Society, including two decades of service as a member of the Administrative Committee, two terms as Society President, and holding most of the Society offices; for service to the IEEE as a member of the IEEE Board of Directors and as IEEE Vice-President for Education; and for a career of service to the Johns Hopkins Applied Physics Laboratory in the field of instrumentation for a multiplicity of programs."*

J. Barry Oakes received his B.S. in Physics from Rensselaer Polytechnic Institute in 1949 and the M.A. in Physics from the University of Michigan in 1950. For the majority of his career he served on the Professional Staff at the Johns Hopkins Applied Physics Laboratory, acting as Section and Assistant Group Supervisor, S3S, from 1987 until his retirement.

Mr. Oakes career technical contributions were widespread with publications covering clinical engineering, space electronics and systems, and transistor circuit design. Mr. Oakes co-authored the book *Linear Vacuum Tube and Transistor Circuits* (McGraw-Hill:1960), with A.J. Cote, Jr. Mr. Oakes' papers include transistor design for oscillators, pulse forming, IF amplifiers, and high stability oscillators in spacecraft. He wrote the "Electrical Safety" Chapter for the *Handbook of Clinical Engineering* (CRC Press:1980) and the chapter "Equipment Acquisition" in *Principles and Practices for Clinical Engineering* (Prentice Hall:1979).

Mr. Oakes served his first term as President of the I&M Society in 1976 and has remained to this day an active contributor to both our Society and to the IEEE at large. Joining the AdCom in 1974 he has since served as Treasurer, Vice President Finance, two terms as Society President, and numerous other Committees. He was conference Chairman for IMTC 1989. Mr. Oakes served on many IEEE Committees including USAB PCE Chairman, EAB Chairman, Vice President Educational Activities (1983-1984), TAB member (1981-1982), Director Division II (1981-82), Chairman TAB Awards and Recognition Committee (1978-83). He was a member of the IEEE Board of Directors from 1981 to 1984. He received the prestigious IEEE Centennial Medal in 1984 and was named a Fellow of the IEEE in 1986. He has been a member of Sigma Xi since 1986.

## 2007 IEEE Fellow Awards

The IEEE Fellows Program was established to recognize and honor outstanding members for their significant accomplishments in the advancement or application of engineering, science, and technology and for their contributions to the mission of the IEEE: to advance global prosperity by fostering technological innovation, enabling members' careers and promoting community worldwide.

The IEEE Fellows are an elite group from around the globe. The IEEE looks to the Fellows for guidance and leadership as the world of electrical and electronic technology continues to evolve.

The Instrumentation and Measurement Society Fellows Identification and Evaluation Committees, currently led by Barry Oakes, identify candidates, gather references from their peers, and submit detailed applications to the IEEE Fellow Committee in a confidential process typically extending over several years. After a further rigorous evaluation and selection process by the IEEE Fellow Committee, each year a slate of candidates for elevation to Fellow is proposed to the IEEE Board of Directors for approval.

Per IEEE rules, the number of successful candidates, in any year, must not exceed one-tenth percent of the IEEE voting membership on record as of 31 December of the preceding year. This year only 268 Fellows were elevated from approximately 365,000 members. IEEE Fellows receive a certificate and pin.

The Instrumentation and Measurement Society members elevated to Fellow in 2007 are:

**Tadeusz DOBROWIECKI**, Budapest University of Technology and Economics, Budapest, Hungary

*for contributions to intelligent measurement systems, artificial intelligence, and identification of nonlinear systems*

Bio not available at time of printing.

Photo not available at time of printing.



**Richard C. HOCHBERG**, Computer Sciences Corporation, Arlington, VA, USA

*for leadership in engineering and management of advanced electronic systems*

Richard C. Hochberg (SM'88; Fellow'07), earned his Ph.D. in electrical and computer engineering at Kansas State University, Manhattan Kansas, USA, with research interests in the areas of instrumentation and fiber optic sensors in 1987. Dr. Hochberg is an active member of IEEE and is serving as the Administrative Committee of the Instrumentation and Measurement Society. He is also a Reviewer for the IEEE Transactions on Instrumentation and Measurement. Dr. Hochberg is employed by the Computer Sciences Corporation (CSC) as a Program Manager supporting the US Department of Defense in Arlington, Virginia, USA. He has a wide range of experience in guided missiles research and development, and complex systems acquisition management.





**John W. SHEPPARD**, ARINC Incorporated , Pasadena, MD, USA  
*for contributions to system-level diagnosis and prognosis*

Dr. John Sheppard is an Assistant Research Professor in the Department of Computer Science at Johns Hopkins University. Recently, he was elected as an IEEE Fellow "for contributions to system-level diagnosis and prognosis." Prior to joining Hopkins, he was a Fellow at ARINC Incorporated in Annapolis, MD where he worked for almost 20 years. Dr. Sheppard is the founding director of the Numerical Intelligent Systems Laboratory at Hopkins where he performs research in Bayesian classification, factorial hidden Markov models, recurrent neural networks, and reinforcement learning. In addition, Dr. Sheppard is active in IEEE Standards activities. Currently, he serves as a member of the IEEE Computer Society Standards Activities Board and is the Vice Chairman of IEEE Standards Coordinating Committee 20 on Test and Diagnosis for Electronic Systems. He has served as co-chair of the Diagnostic and Maintenance Control Subcommittee of SCC20 and as an official US delegate to the International Electrotechnical Commission's Technical Committee 93 on Design Automation.



**Reiner S. THOMA**, Ilmenau University of Technology, Ilmenau,  
Thüringen, Germany  
*for contributions to high-resolution multidimensional channel sounding*

Reiner S. Thomä, received the Dipl.-Ing. (MSc), Dr.-Ing. (PhD) and the Dr.-Ing. habil. degrees, in electrical engineering (information technology) from Technische Hochschule Ilmenau, Germany, in 1975, 1983, and 1989, respectively.

From 1975 to 1988 he was a research assistant in the fields of electronic circuits, measurement engineering, and digital signal processing at the same university. His research topics were in surface acoustic waves filter design and FFT spectral analysis. From 1988 to 1990 he was a research associate at the Akademie der Wissenschaften der DDR (Zentrum für Wissenschaftlichen Gerätebau). During this period he was working in the field of radio surveillance. In 1991 he spent a three month sabbatical at the University of Erlangen-Nürnberg (Lehrstuhl für Nachrichtentechnik).

Since 1992 he has been a Professor of Electrical Engineering (Electronic Measurement) at Technische Universität Ilmenau (Ilmenau University of Technology) and from 1999 until 2005 he was the director of the Institute of Communication and Measurement at the same university.

**Annamaria R. VARKONYI-KOCZY**, Budapest University of Technology and Economics  
Budapest, Hungary

*for contributions to digital signal processing in measurement and control*

Bio not available at time of printing.

Photo not available at time of printing.



**Barry WOOD**, National Research Council of Canada, Ottawa,  
Ontario, Canada

*for contributions to fundamental electrical measurement standards*

Barry M. Wood was born in Oshawa, Ontario, Canada on September 27, 1951. He received the B.Sc. degree in physics and mathematics from the University of New Brunswick, Fredericton, N.B., Canada, in 1973 and the M.Sc. degree from the University of Western Ontario, London, Ont., Canada, in 1974. He received the Ph.D. degree in physics from the University of Toronto, Toronto, Ont., Canada in 1982. He joined the Physics Division of the National Research Council of Canada in 1981. He became the Section Head of the Thermometry and Electrical Standards Section of the Laboratory for Basic Standards in 1986. His research concerns the Josephson volt, the quantum Hall effect, the calculable capacitor, ac bridges and cryogenic standards. He is a member of the CODATA Task Group on Fundamental Constants and the chairman of the Consultative Committee for Electricity and Magnetism's working group on the SI.



**Hideto IWAOKA**, Yokogawa Electric Corporation, Tokyo, Japan  
*for leadership in developing optical devices and optical  
microelectromechanical systems for sensing and measuring  
instruments*

Hideto Iwaoka received the B.E., M.E., and Dr.Eng. Degrees in electrical engineering from Keio University, Japan, in 1969, 1971 and 1987 respectively. In 1971, he joined Yokogawa Electric Corporation, Tokyo Japan. He contributed to the research and development of the measuring instruments and the devices, Nuclear Quadrupole Resonance (NQR) Thermometry, the fast scan method of Magnetic Resonance Imaging (MRI), optical devices and Optical MEMS (Micro Electro Mechanical Systems) for measurement instruments. Dr. Iwaoka is now a professor of Kanazawa Institute of Technology since 2006, where his interests are developing sensors, MEMS and sensor network applications. Professor Iwaoka was awarded the Best Paper Awards from the Society of Instrument and Control Engineers in Japan (SICE) and has several patents. Professor Iwaoka has served on several international conferences, as a General co-chair of IEEE/LEOS International Conference on Optical MEMS 2002, and with the International Workshop on Networked Sensing Systems 2005(INSS2005).



**Jan VERSPECHT**, Jan Verspecht b.v.b.a., Steenhuffel, Belgium  
*for contributions to the area of large-signal microwave measurements*

In 1990 Jan Verspecht joined Hewlett-Packard as a research engineer after graduating from the Vrije Universiteit Brussel (VUB). He received the doctoral degree from the VUB in 1995. As a Ph.D. student Jan developed calibration procedures for characterizing nonlinear microwave devices. In 1991 Jan interrupted his job at HP to fulfill his compulsory military service. As an officer of the reserves he worked for the microwave lab of the Belgian army developing and characterizing anti-radar stealth technology. After receiving his Ph.D. degree Jan continued with the development of the Large-Signal Network Analyzer (LSNA). He soon invented black-box frequency domain modeling techniques based on LSNA measurements. In 1999 Jan started working for Agilent Technologies (the HP spin-off) where he was promoted to the position of "Technical Lead". In that position he worked as an internal consultant and he assisted the first LSNA customers. Early in 2003 Jan started to work as an independent consultant by founding the company "Jan Verspecht b.v.b.a.". Working as an independent consultant for Agilent Technologies, Jan has developed the advanced "poly-harmonic distortion" (PHD) model. Together with the XLIM Institute in France (formerly IRCOM) Jan has developed advanced time domain load pull techniques for characterizing microwave power transistors.

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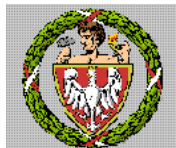
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## IMTC Tradition

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. During 24 years IMTC traveled first across the states of USA, and since 1994 across three continents of the world. The following list contains locations and themes of the IMTC 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*



## *I<sup>2</sup>MTC – International Instrumentation & Measurement Technology Conference*

May 12-15, 2008

Fairmont Empress Hotel & Conference Center  
Victoria, Vancouver Island, British Columbia, Canada

### CALL FOR PAPERS

The Conference focuses on all aspects of instrumentation and measurement science and technology – research, development and applications. The list of program topics includes but is not limited to:

#### MEASUREMENT SCIENCE & EDUCATION

Theoretical foundations  
Quantities, units & standards  
Calibration & self-calibration  
Measurement uncertainty  
Methodology of teaching

#### MEASUREMENT SYSTEMS

Automated test & diagnostics systems  
Fault-tolerant & resilient measurement systems  
Integrated multimodal measurement systems  
Distributed measurement systems  
Autonomous measurement systems  
Non-invasive measurement systems  
Virtual measurement systems  
Measurement microsystems  
Human-computer interface

#### MEASUREMENT-DATA ACQUISITION

Sensors & transducers  
A/D and D/A converters  
Analog & mixed signal processing  
Measurement signal generation  
Remote measurements & telemetry

#### MEASUREMENT-DATA PROCESSING

Mathematical modeling of signals and systems  
Data preprocessing & postprocessing  
Digital signal processing  
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Inverse problems & signal reconstruction  
Signal detection & classification  
Sensor array processing  
Soft computing  
Measurement-data management

#### MEASUREMENTS OF PHYSICAL QUANTITIES

Electrical & power measurements  
Dielectric & magnetic measurements  
Temperature, moisture & humidity measurements  
Mechanical measurements & material analysis  
Optical measurements  
Chemical & biological measurements

#### MEASUREMENT APPLICATIONS

Robotics & industrial monitoring  
Automotive & transportation  
Avionics & aerospace  
Ships and marine technology  
Environment monitoring  
Medicine & health care  
Security & biometrics  
Telecommunications

The program will include special sessions and tutorials on May 11, 2008. Potential authors are invited to submit extended abstracts (3 or 4 pages in English) via the *I<sup>2</sup>MTC* website (<http://ewh.ieee.org/soc/im/imtc/i2mtc2008>). A Student Paper Contest will be held for both graduate and undergraduate student papers, with cash awards for the best papers and travel subsidies ranging from USD 300 to USD 1000 depending on student location. Extended abstracts should be submitted by the students according to the rules posted on the website and should be identified as student papers and classified as graduate or undergraduate.

*I<sup>2</sup>MTC 2008* deadlines are:

- **October 15, 2007** – Submission of extended abstracts,
- **December 10, 2007** – Notification of authors on the acceptance or rejection of extended abstracts,
- **March 10, 2008** – Submission of camera-ready full-text papers.

The authors of papers, presented during *I<sup>2</sup>MTC 2008*, will be allowed to submit updated and extended versions of those papers to the Special Issue of *IEEE Transactions on Instrumentation & Measurement* on *I<sup>2</sup>MTC 2008* to be published in 2009.

For additional information on <i>I<sup>2</sup>MTC</i> , contact:	
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Technology, USA

# IMTC 2007 Technical Program Tracks & Sessions

## Tuesday, May 1

### **Special Session Tu2ab: Autonomous Sensors**

*Tuesday, May 1, 10:30AM-12:00PM, Room: Ballroom AB*

*Chair: Ramon Pallas Areny*

10:30AM *Characterization of Thermoelectric Modules for Powering Autonomous Sensors* [#7502]

Marco Ferrari, Vittorio Ferrari, Michele Guizzetti, Daniele Marioli and Andrea Taroni

University of Brescia, Italy

[Click here to open the full paper](#)

10:45AM *Investigation to the Use of Vibration Energy for Supply of Hearing Aids* [#7511]

Nidhal Ben Amor and Olfa Kanoun

University of Sfax, Tunisia; University of Kassel, Germany

[Click here to open the full paper](#)

11:00AM *On the Use of Decoupling Capacitors in Autonomous Sensors* [#7376]

Roberto E Serrano-Finetti and Ramon Pallas-Areny

Technical University of Catalonia, Spain

[Click here to open the full paper](#)

11:15AM *Investigation on Coupling Strategies for Wireless Implant Communications* [#7343]

Marc Simon Wegmueller, Martin Hediger, Thomas Kaufmann, Michael Oberle, Niels Kuster, and

Wolfgang Fichtner

ETH Zurich, Switzerland; Foundation for Research on IT in Society, Switzerland

[Click here to open the full paper](#)

11:30AM *Energy-Aware Data Acquisition in Wireless Sensor Networks* [#7535]

Cheng-tai Yeh, Zhaoyan Fan and Robert X. Gao

University of Massachusetts Amherst, United States

[Click here to open the full paper](#)

### **Special Session Tu2c: Imaging Systems and Techniques I**

*Tuesday, May 1, 10:30AM-12:00PM, Room: Ballroom C*

*Chair: George Giakos*

10:30AM *Detection of defects in wood slabs by using a microwave imaging technique* [#7195]

Matteo Pastorino, Andrea Salvade, Ricardo Monleone, Thomas Bartesaghi, Giovanni Bozza, and Andrea Randazzo

DIBE - University of Genoa, Italy; DTI - SUPSI, Switzerland

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10:45AM *MTF and DQE Measurements of Mercuric Iodide X-ray Imagers* [#7696]  
George Zentai and Larry Partain  
Ginzton Technology Center of Varian Medical Syst, United States

[Click here to open the full paper](#)

11:00AM *Measuring Motion Parameters of Ionic Polymer-Metal Composites (IPMC) Actuators with a CCD camera* [#7467]  
Kiriakos Tsiakmakis, Jordi Brufau, Manel Puig-Vidal and Theodore Laopoulos  
Aristotle University of Thessaloniki, Greece; University of Barcelona, Spain

[Click here to open the full paper](#)

11:15AM *Robot vision system based on a 3D-TOF camera* [#7423]  
Stephan Hussmann and Thorsten Liepert  
Westcoast University of Applied Sciences, Germany

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11:30AM *Image Sharpness Based Range Sensing Using Pattern Projection* [#7127]  
Ilkka Jolma and Anssi Makynen  
University of Oulu, Finland

[Click here to open the full paper](#)

## **Special Session Tu2d: Medical Measurements and Instrumentation I**

*Tuesday, May 1, 10:30AM-12:00PM, Room: Ballroom D*  
*Chair: Marco Parvis, Sergio Rapuano*

10:30AM *Millimeter and Submillimeter Wave Dielectric Properties of Tumorous and Non-tumorous Breast Tissues* [#7556]  
Usman Khan, Nawaf Almoayed, Nicholas Nguyen, Mohammed Afsar and Stephen Naber  
Tufts University, United States; Tufts New England Medical Center, United States

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10:45AM *Experimental Evaluation of Flicker Effects on Human Subjects* [#7191]  
Lorenzo Peretto, Luigi Rovati, Charles Riva, Giorgia Salvatori and Roberto Tinarelli  
University of Bologna, Italy; University of Modena and Reggio Emilia, Italy

[Click here to open the full paper](#)

11:00AM *Design of a Low-cost Physiological Parameter Measurement and Monitoring Device* [#7291]  
Gourab Sen Gupta, Subhas Mukhopadhyay, Benjamin Devlin and Serge Demidenko  
Singapore Polytechnic, Singapore; Massey University, New Zealand

[Click here to open the full paper](#)

11:15AM *Enhanced Adsorption of Glucose Oxidase by Introducing Artificial Porosity into Polypyrrole Based Glucose Biosensors* [#7410]

E.M.I. Mala Ekanayake, D.M.G. Preethichandra and Keiichi Kaneto  
Kyushu Institute of Technology, Japan

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11:30AM *Vital Signs Monitoring System Based on EMFi Sensors and Wavelet Analysis* [#7604]

Octavian Postolache, Pedro Girao, Gabriela Postolache and Jose Miguel Dias Pereira  
Instituto de Telecomunicacoes, Lisboa, Portugal; Universidade Atlantica, Lisboa, Portugal; EST-Setubal LabIM/IPS, Portugal

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## **Session Tu2ef: Robotics & Industrial Monitoring**

*Tuesday, May 1, 10:30AM-12:00PM, Room: Ballroom EF*

*Chair: Emil Petriu*

10:30AM *A Measurement System for Lyophilization Process Monitoring* [#7453]

Alberto Vallan  
Politecnico di Torino - Dip. di Elettronica, Italy

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10:45AM *Emergent Behavioral Modeling Language in Obstacle Avoidance* [#7480]

Razvan Cioarga, Bogdan Ciubotaru, Dan Chiciudean, Mihai Micea, Vladimir Cretu and Voicu Groza  
"Politehnica" University of Timisoara, Romania

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11:00AM *Connectivity Improvement in Wireless Sensor Networks Based on Mobile Nodes* [#7489]

Bogdan Ciubotaru, Razvan Cioarga, Dan Chiciudean, Mihai Micea and Mircea Stratulat  
"Politehnica" University of Timisoara, Romania

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11:15AM *A Spatial Sound Localization System for Mobile Robots* [#7114]

Huakang Li, Takuya Yoshiara, Qunfei Zhao, Teppei Watanabe and Jie Huang  
The University of Aizu, Japan; Shanghai Jiao Tong University, China

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11:30AM *Pellet Size Estimation Using Spherical Fitting* [#7111]

Tobias Andersson, Matthew Thurley and Olov Marklund  
Lulea University of Technology, Sweden

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## **Session Tu2ws: Mathematical Modeling of Signals and Systems**

*Tuesday, May 1, 10:30AM-12:00PM, Room: Wawel-Syrena*

*Chair: Lee Barford*

*10:30AM Using the Thue-Morse Sequence to cancel low-Frequency Fluctuations* [#7090]

Jan Schat

NXP Semiconductors, Germany

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*10:45AM Composite local-linear state-space models for the behavioral modeling of digital devices* [#7171]

Igor Simone Stievano, Claudio Siviero, Flavio Canavero and Ivan Maio

Politecnico di Torino, Dipartimento di Elettroni, Italy

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*11:00AM Power transients characterization and classification using higher-order cumulants and neural networks* [#7080]

Juan Jose Gonzalez de la Rosa, Antonio Moreno Munoz and Africa Luque Martinez

University of Cadiz, Spain; University of Cordoba, Spain; Cetecom, Spain

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*11:15AM A Sparse Robust Model for a Linz-Donawitz Steel Converter* [#7258]

Jozsef Valyon and Gabor Horvah

Budapest University of Technology and Economics, Hungary

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*11:30AM Temperature Dependence of Fixed Pattern Noise in Logarithmic CMOS Image Sensors* [#7628]

Dileepan Joseph and Steve Collins

University of Alberta, Canada; University of Oxford, United Kingdom

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## **Poster Session Tu2p: Measurement Science & Education; Measurement Systems**

*Tuesday, May 1, 10:30AM-12:00PM, Room: Poster Hall*

*Expression of Measurement Uncertainty in Quantile Domain* [#7654]

Domenico Alessandro Lampasi

University of Rome "La Sapienza", Italy

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*High-Performance Digitally Synthesized Source for Very-Low Frequency AC Voltage Calibrator* [#7679]

Marian Kampik

Silesian University of Technology, Poland

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*Coherence of Comparison Results for 10 mH Inductance Standards* [#7234]

Tadeusz Skubis, Andrzej Met and Krzysztof Musiol  
Silesian University Of Technology in Gliwice, Poland

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*Frequency stabilization of an external-cavity diode laser against HI molecule at 1.541  $\mu\text{m}$*  [#7508]

Alessandro Pesatori, Michele Norgia, Gianluca Galzerano, Elio Bava and Cesare Svelto  
Dipartimento Elettronica e Informazione - Polite, Italy; Politecnico di Milano Dipartimento Elettronica e, Italy; Istituto di Fotonica e Nanotecnologie - CNR, Dip, Italy; INRiM c/o Istituto Elettrotecnico Nazionale "Gal, Italy

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*Allan Variance Analysis of Measurement Data Series for Instrument Verification* [#7259]

Matteo Bertocco, Antonio Monetti, Enrico Mottin, Claudio Narduzzi and Elisabetta Sieni  
Univ. di Padova, Dept. Information Engineering, Italy; Infineon Technologies Italia Srl, Italy

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*Estimating Uncertainty of Correlated Quantities - Comparison of Two Methods* [#7341]

Krzysztof Konopka  
Silesian University of Technology, Poland

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*Two Simple Techniques for Hysteresis Power Losses Measurement* [#7642]

Inacio Bianchi and Marcela Frank da Silva  
UNESP - Sao Paulo State University, Brazil

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*A System for the Measurement of the Temperature Dependence Performances of Quartz Oscillators: a Study of the Analytical Model of the Failure Rate* [#7618]

Lorenzo Peretto, Paola Rinaldi and Carlo Duri  
University of Bologna, Italy; UNIVERSITY OF BOLOGNA, Italy

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*Fault Classification Tool for High Pressure Water Jet Pumps* [#7392]

Massimiliano Annoni, Loredana Cristaldi and Massimo Lazzaroni  
Politecnico di Milano, Italy; Universita' degli Studi di Milano, Italy

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*An Overlapped Scan Method for Enhanced 3D Radome Characterization* [#7179]

Justin Barnes, Mark Yeary, Kristian Olivero, Jess Phillips and Tamer Ibrahim  
University of Oklahoma, United States; Tinker Air Force Base, United States

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*Enlarging The Input Frequency Range Of A Phase Noise Meter Through Bandpass Sampling Strategies* [#7664]

Leopoldo Angrisani, Mauro D'Arco, Charles Greenhall and Rosario Schiano Lo Moriello  
Universita di Napoli Federico II - DIS, Italy; Universita' di Napoli Federico II DIEL, Italy; Jet Propulsion Laboratory (CIT), United States

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*Two-center Radial Basis Function Network For Classification of Soft Faults* [#7244]

Michal Kowalewski  
Gdansk University of Technology, Poland

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*A Multichannel Measurement System for Automatic Testing of Acoustic Calibrators and Adjustment of their Parameters* [#7631]

Andrzej Podgorski, Serghei Duminov and Ryszard Leoniak  
Warsaw University of Technology, Poland; SVANTEK sp. z o. o., Moldova, Republic of; SVANTEK sp. z o. o., Poland

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*Automated Power Quality Monitoring System for On-line Detection and Classification of Disturbances* [#7083]

Vaclav Matz, Tomas Radil, Pedro Ramos and Antonio Serra  
Czech Technical University, FEE, Czech Republic; Instituto de Telecomunicacoes, Portugal; Instituto de Telecomunicacoes / UTL, IST, Portugal

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*Development and experimental characterization of an electrolytic tank for the simulation of turbulent flow speed profiles in pressure pipes* [#7245]

Giovanni Bucci, Edoardo Fiorucci, Maria Teresa Todisco and Carmine Di Nucci  
DIEI - Universita di L'Aquila, Italy; DISAT- Universita di L'Aquila, Italy

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*On-Line System for fault detection in Induction Machines based on Wavelet convolution* [#7339]

Jordi Cusido, Javier Rosero, Meritxell Cusido, Antoni Garcia, Juan Antonio Ortega and Luis Romeral  
MCIA, UPC Research Group, Spain

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*Fillet Weld Identification for Automatic Inspection of Spherical Tanks* [#7507]

Elyson Carvalho, Lucas Molina, Eduardo Freire, Raimundo Freire and Benedito Luciano  
Federal University of Campina Grande, Brazil; Federal University of Sergipe, Brazil

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*Metrological Characteristics of Small Angle Mossbauer Spectrometer* [#7068]

Konstantinos Athanassiadis  
Alexander Technological Educational Institute, Greece

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*Instrumentation and Measurement Method for the Inspection of peeled Steel Rods* [#7415]  
Ingo Reindl and Paul O'Leary  
University of Leoben, Austria

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*A High Speed Digital Ultrasonic Flaw Detector Based on PC and USB* [#7303]  
Ziqiang Song, Qiang Wang, Xiuli Du and Yan Wang  
Harbin Institute of Technology, China

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*A Decentralized Information Filter for the State Estimation in Electrical Power Systems* [#7577]  
Gabriele D'Antona, Antonello Monti and Ferdinanda Ponci  
Politecnico di Milano, Italy; University of South Carolina, United States

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*Analysis of Clock Tracking Performances for a Software-only IEEE 1588 Implementation* [#7263]  
Luigino Benetazzo, Claudio Narduzzi and Marco Stellini  
Univ. di Padova, Dept. Information Engineering, Italy

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*Evaluation of Timing Characteristics of Industrial Ethernet Networks Synchronized by means of IEEE 1588* [#7521]  
Alessandro Depari, Paolo Ferrari, Alessandra Flammini, Daniele Marioli and Andrea Taroni  
University of Brescia, Italy

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*Communication with nodes of distributed measurement system for hydrocarbon pollution monitoring using Jabber protocol* [#7229]  
Lukasz Makowski and Andrzej Michalski  
Warsaw University of Technology, Poland

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*Integration of low computational power nodes in a GRID measurement architecture* [#7438]  
Alessio Carullo, Simone Corbellini, Franco Ferraris, Marco Parvis and Alberto Vallan  
Politecnico di Torino - Dip. di Elettronica, Italy

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*Power-quality index negotiation criterion for power system soft reconfiguration* [#7571]  
Aalhad Deshmukh, Ferdinanda Ponci, Loredana Cristaldi and Marco Faifer  
University of South Carolina, United States; Politecnico di Milano, Italy

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*A Large Bandwidth and Dynamic Range Magnetic Field Probe* [#7122]  
Andrea Mariscotti  
DIE - University of Genova, Italy

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*Contactless Electromagnetic Excitation of Conductive Microstructures for Resonant Sensors* [#7493]  
Marco Bau, Vittorio Ferrari, Daniele Marioli, Emilio Sardini, Mauro Serpelloni and Andrea Taroni  
University of Brescia, Italy

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*Mass Flowmeter for Screw Conveyors Based on Capacitive Sensing* [#7069]  
Anton Fuchs, Hubert Zangl and Georg Brasseur  
Graz University of Technology, Austria

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*Dynamic virtual test of power electronics converters* [#7323]  
Marco Riva and Federico Belloni  
University of Milan, Italy

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*On Time- and Frequency-domain equivalence for compliant EMI measurements* [#7180]  
Andrea Mariscotti  
DIE - University of Genova, Italy

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*A Comparative Analysis of the Influence of Methods for Outliers Detection on the Performance of Data Driven Models* [#7457]  
Antonino Di Bella, Salvatore Graziani, Giuseppe Napoli, Maria Gabriella Xibilia and Luigi Fortuna  
DIEES-University of Catania, Italy; University of Messina, Italy

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*A New Structure for CMOS Thermal-Bubble-Based Accelerometer* [#7318]  
Chih-Hsiung Shen, Shu-Jung Chen and Yin-Ting Yang  
National Changhua University of Education, Taiwan

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*Micro Cracking in Stainless Steel pipe Detection by using Acoustic Emission and Crest Factor technique* [#7150]  
Jirapong Lim and Tonphong Kaewkongka  
"King Mongkut's -North Bangkok University", Thailand; "Chulalongkorn University", Thailand

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*Development of Electronic Components for an Integrated Ultrasonic Front End ASIC* [#7152]  
Vladimir Ivchenko, Alexander Kalashnikov, Richard Challis, Barrie Hayes-Gill and Roger Light  
University of Nottingham, United Kingdom

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*Time Model of Data Processing Block in Measurement System* [#7389]  
Piotr Bilski and Robert Lukaszewski  
Warsaw Agricultural University, Poland; Warsaw University of Technology, Poland

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*Direct interface for capacitive sensors based on the charge transfer method* [#7395]  
Jorge E. Gaitan-Pitre, Manuel Gasulla and Ramon Pallas-Areny  
University of Pamplona, Colombia; Technical University of Catalonia (UPC), Spain

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*Feature extraction from an IR sensor array for localization and surface recognition of moving cylindrical objects* [#7580]  
Vladislav Pavlov, Heinrich Ruser and Michael Horn  
University of Bundeswehr Muenchen, Neubiberg, Germany

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### **Special Session Tu3ab: Flow Sensors**

*Tuesday, May 1, 2:00PM-3:30PM, Room: Ballroom AB*  
Chair: Georg Brasseur

*2:00PM Estimation of Flow Parameters for the Needs of the Electromagnetic Measurement in Open Channels Based on a Concept of Inner Product Spaces* [#7104]  
Jacek Jakubowski and Andrzej Michalski  
Military University of Technology, Poland; Warsaw University of Technology, Poland

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*2:15PM Exciting Frequency Optimization For Electromagnetic Flow Meter With Genetic Algorithm* [#7169]  
Yan Yi, Wu Hong Ping and Wu Huifeng  
HangZhou Dianzi University, China

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*2:30PM Experimental and Theoretical Investigations Concerning the Influence of Stagnation Region on Karman Vortex Shedding* [#7190]  
Grzegorz Pankanin  
Institute of Electronic Systems, WUT, Poland

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*2:45PM Finite Element Modelling of Intrusive Electrostatic Sensors for the Measurement of Pulverised Fuel Flows* [#7347]  
Jan Krabicka and Yong Yan  
University of Kent, United Kingdom

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*3:00PM Validation of Multiphase Flowmeters Using Capacitance Sensing Techniques* [#7406]  
Ahmed Abou-Arkoub, Richard Thorn and Amar Bousbaine  
Mohawk College, Canada; Victoria University, Australia; University of Derby, United Kingdom

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## Special Session Tu3c: Imaging Systems and Techniques II

*Tuesday, May 1, 2:00PM-3:30PM, Room: Ballroom C*

*Chair: Matteo Pastorino*

2:00PM *A Numerical Assessment of the Semiconvergence Behavior in an Inverse-Scattering Approach to Electromagnetic Imaging* [#7193]

Giovanni Bozza, Claudio Estatico, Matteo Pastorino and Andrea Randazzo  
DIBE - University of Genoa, Italy; University of Cagliari, Italy

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2:15PM *Independent Component Analysis for Removing X-ray Scatter in X-ray Images* [#7659]

Yen-Wei Chen, Xian-Hua Han, Shiro Oikawa and Akinori Fujita  
Ritsumeikan University, Japan; Central South Forest University, China

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2:30PM *3-D Graphic Image of Vibration Pattern of Printed Circuit Board by Using Holography* [#7199]

Hiromichi Kubota, Masanari Taniguchi, Shosuke Suzuki and Tasuku Takagi  
Tohoku Bunka Gakuen University, Japan

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2:45PM *Single-Pixel Polarimetric Detection and Discrimination in Cluttered Media* [#7598]

George Giakos, Sriram Atreya Paturi, Praneeth Bathini, Srinivas Sukumar and K. Ambadipudi  
University of Akron, United States; University of Akron, Vatican City State (Holy See)

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3:00PM *Study of Positioning Techniques for Skull Radiography using CT images* [#7380]

Toshinori Maruyama and Hideki Yamamoto  
Okayama University, Japan

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## Special Session Tu3d: Medical Measurements and Instrumentation II

*Tuesday, May 1, 2:00PM-3:30PM, Room: Ballroom D*

*Chair: Marco Parvis, Sergio Rapuano*

2:00PM *A High-Fidelity Acquisition System for Snore Signals: Design and Implementation* [#7078]

Andrew Keong Ng and T.S. Koh  
Nanyang Technological University, Singapore

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2:15PM *Flexible Measurement System for the Analysis of Human Auditory Deficits* [#7231]

Luigino Benetazzo, Piero Zanchetta and Claudio Narduzzi  
University of Padova, Italy

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2:30PM *Real-Time Malaysian Sign Language Translation using Colour Segmentation and Neural Network* [#7364]

Rini Akmeiawati, Melanie Ooi and Ye Chow Kuang  
Monash University, Malaysia

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2:45PM *The Medical Signals Acquisition and Management System for Computer-Aid of Prostate Cancer Diagnosis* [#7430]

Jaroslav Makal, Agnieszka Onisko and Andrzej Nazarkiewicz  
Bialystok Technical University, Poland; Provincial Integrated Hospital, Poland

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3:00PM *Dedicated electronics for electrical stimulation and EEG recording using the same electrodes: application to the automatic control of epileptic seizures by neuro-stimulation* [#7473]

Aktham Asfour, Cecile Fiche and Colin Deransart  
INSERM U594, France; INSERM U704, France

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### **Session Tu3ef: Measurement for Telecommunication & Transportation**

*Tuesday, May 1, 2:00PM-3:30PM, Room: Ballroom EF*

*Chair: Abdulmotaleb El Saddik*

2:00PM *Session Initiation Protocol Automatic Debugger* [#7613]

Doris Bao, Domenico Luca Carni, Luca De Vito and Laura Tomaciello  
University of Sannio, Italy; University of Calabria, Italy

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2:15PM *Power measurement in dvb t systems: on the suitability of parametric spectral estimation in dsp-based meters* [#7474]

Leopoldo Angrisani, Domenico Capriglione, Luigi Ferrigno and Gianfranco Miele  
DIS, University of Naples Federico II, Italy; DAEIMI University of Cassino, Italy

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2:30PM *A Measurement-Oriented Approach to Modeling Packet Loss in IP Networks* [#7584]

Stejarel Veres and Dan Ionescu  
University of Ottawa, Canada

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2:45PM *Automatic Node Discovery in CAN (Controller Area Network) Controllers using Reserved Identifier Bits* [#7586]

Yadunandana Yellambalase and Minsu Choi  
University of Missouri-Rolla, United States

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3:00PM *A Far-Range Off-Line Camera Calibration Method for Stereo Lane Detection Systems* [#7564]  
Andras Bodis-Szomoru, Tamas Daboczi and Zoltan Fazekas  
Hungary

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### **Session Tu3ws: Digital Signal Processing**

*Tuesday, May 1, 2:00PM-3:30PM, Room: Wawel-Syrena*  
*Chair: Piet Broersen*

2:00PM *A Novel QPC Detector for the Health Monitoring of Rotating Machines* [#7545]  
Taekhyun Kim, Edward J. Powers, W. Mack Grady and Ari Arapostathis  
The University of Texas at Austin, United States

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2:15PM *Testbed for Wireless Adaptive Signal Processing Systems* [#7223]  
Gyorgy Orosz, Laszlo Sujbert and Gabor Peceli  
Budapest University of Technology and Economics, Hungary

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2:30PM *Multiharmonic Waveform Fitting of Periodic Signals using Genetic Algorithms* [#7345]  
Fernando Janeiro and Pedro Ramos  
Instituto de Telecomunicacoes, Portugal

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2:45PM *Decomposition Based Synthesis in Implementation of Digital Filters for Wavelet Transform Application Targeted FPGA Devices* [#7067]  
Mariusz Rawski, Bogdan Falkowski and Tadeusz Luba  
Warsaw University of Technology, Poland; Nanyang Technological University, Singapore

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3:00PM *Rank Order Filters for Time-Stamped Signals* [#7033]  
Lee Barford  
Agilent Laboratories, United States

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### **Special Session Tu4ab: Smart Sensors and Sensing Technology**

*Tuesday, May 1, 4:00PM-5:30PM, Room: Ballroom AB*  
*Chair: Subhas C. Mukhopadhyay*

4:00PM *A New Method for Internal Temperature Profile Measurement by Ultrasound* [#7213]  
Ikuo Ihara and Manabu Takahashi  
Nagaoka University of Technology, Japan

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4:15PM *Radiation damage analysis of a commercial optical CMOS image sensor* [#7337]  
Preeti Vodnala, Lawrence Lurio and Micheal Haji-Sheikh  
Northern Illinois University, United States

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4:30PM *Development of a fibre optic sensor for the detection of harmful algae bloom and in particular domoic acid* [#7391]  
Eoin O'Connell, William B Lyons, Cormac Sheridan and Elfed Lewis  
University of Limerick, Ireland

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4:45PM *Low-Power Carbon Monoxide Sensors for Wireless Distributed Electronic Noses* [#7509]  
Sebastian Bicelli, Alessandro Depari, Alessandra Flammini, Daniele Marioli, Andrea Ponzoni, Giorgio Sberveglieri and Andrea Taroni  
University of Brescia, Italy

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5:00PM *Ground Penetrating Radar: A Smart Sensor for the Evaluation of the Railway Trackbed* [#7499]  
Andreas Loizos and Christina Plati  
National Technical University of Athens, Greece

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### **Special Session Tu4c: System Identification Applied to Solve Measurement Problems: nonlinear systems**

*Tuesday, May 1, 4:00PM-5:30PM, Room: Ballroom C*  
*Chair: Rik Pintelon*

4:00PM *Application of Blind Identification to Nonlinear Calibration* [#7094]  
Laurent Vanbeylen, Rik Pintelon and Johan Schoukens  
Vrije Universiteit Brussel, dep.ELEC, Belgium

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4:15PM *Modelling of Direction-dependent Systems using Bilinear Models* [#7113]  
Timothy Tzen Yun Yap, Ai Hui Tan and Mathias Fui Lin Foo  
Faculty of IT, Multimedia University, Malaysia; Faculty of Engineering, Multimedia University, Malaysia

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4:30PM *On the Equivalence between some Block Oriented Nonlinear Models and Nonlinear Polynomial State Space Models* [#7320]  
Johan Paduart, Johan Schoukens and Liesbeth Gomme  
Vrije Universiteit Brussel - ELEC, Belgium

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4:45PM *Non-linear Volterra Model Identification of Industrial Glueapplication System* [#7388]  
Pavol Mikulik, Linus Michaeli and Jan Saliga  
SCA Hygiene Products, 049 12 Gemerska Horka, Slovakia; Tech. Univ.of Kosice, Letna 9/A, 04120  
Kosice, Slovakia

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5:00PM *Identification of a crystal detector using a block structured nonlinear feedback model* [#7035]  
Johan Schoukens, Liesbeth Gomme, Wendy Van Moer and Yves Rolain  
Vrije Universiteit Brussel, Belgium

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### **Special Session Tu4d: Medical Measurements and Instrumentation III**

*Tuesday, May 1, 4:00PM-5:30PM, Room: Ballroom D*  
*Chair: Marco Parvis, Sergio Rapuano*

4:00PM *A 2.2 microWatt, 95nV/rHz, chopper-stabilized instrumentation amplifier for chronic measurement of ECG and EEG* [#7098]  
Timothy Denison, Kelly Consoer, Wesley Santa, Keith Miesel and Greg Molnar  
Medtronic, United States

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4:15PM *Real-Time Vision-Based Hand Gesture Recognition with Haar-like Features and Grammars* [#7287]  
Qing Chen, Nicolas Georganas and Emil Petriu  
University of Ottawa, Canada

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4:30PM *Side-approach Transfer Measurement for Patient with Spinal Cord Injuries* [#7390]  
Yoshio Tanimoto, Kuniharu Nanba, Akihiro Tokuhito, Hiroyuki Ukida and Hideki Yamamoto  
Kibikogen Rehabilitation Center, Japan; The University of Tokushima, Japan; Okayama University, Japan

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4:45PM *Multisensor Concept for non-invasive Physiological Monitoring* [#7449]  
Andreas Caduff, Marc Donath, Mark Talary, Susanne Haug, Daniel Huber, Werner A. Stahel, Francois Dewarrat, L. S. Jonasson, Hans-Joachim Krebs and Jelena Klisic  
Solianis Monitoring, Switzerland; University Hospital Zurich, Switzerland

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5:00PM *A 3D Acoustic Local Positioning System to Track a Neutrally Bouyant Flow Follower* [#7064]  
Andrew Burnett-Thompson and Trevor York  
University of Manchester, United Kingdom

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## **Session Tu4ef: AC Metrology and Uncertainty Evaluations**

*Tuesday, May 1, 4:00PM-5:30PM, Room: Ballroom EF*

*Chair: Peter Filipiński*

*4:00PM Compensation of a Wide-band Transformer for Generation of Calibrate ac Voltages the Millivolt Range [#7335]*

Umberto Pogliano, Gian Carlo Bosco and Marco Lanzillotti  
I. N. R.I. M., Italy

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*4:15PM Sampling Strategies Comparison for High Accuracy Power Measurements [#7360]*

Jose Ramon Salinas, Francisco Garcia Lagos, Gonzalo Joya and Francisco Sandoval  
Dpto. Tec. Elca., Universidad de Malaga, Spain

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*4:30PM Dissipation Factors of 1 pF, 10 pF, and 100 pF Fused-Silica Capacitors [#7187]*

Yicheng Wang, Gerald FitzPatrick and Andrew Koffman  
NIST, United States

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*4:45PM A comparison of possibility and probability approaches for modelling poor knowledge on measurement distribution [#7501]*

Gilles Mauris  
LISTIC University of Savoie, France

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*5:00PM The RFV method applied to uncertainty estimation: a case study [#7184]*

Alessandro Ferrero and Simona Salicone  
Politecnico di Milano - Milano, Italy

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## **Session Tu4ws: Image Processing & Pattern Recognition**

*Tuesday, May 1, 4:00PM-5:30PM, Room: Wawel-Syrena*

*Chair: Tadeusz Dobrowiecki*

*4:00PM Nonlinear Correlation Measurement Based Registration for Sequential Images [#7294]*

Jing Jin, Qiang Wang and Yi Shen  
Harbin Institute of Technology, China

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*4:15PM Segmentation of Infrared Images Using Cued Morphological Processing of Edge Maps [#7554]*

Christophe L. Herry, Rafik A. Goubran and Monique Frize  
Carleton University, Canada

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4:30PM *A new FPGA-based edge detection system for the gridding of DNA microarray images* [#7459]  
Luca Sterpone and Massimo Violante  
Politecnico di Torino, Italy

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4:45PM *Sequential Monte-Carlo techniques and vision-based methods for road signs detection* [#7338]  
Jean-Charles Noyer, Patrick Lanvin, Mark Yearly and Yan Zhai  
Universite du Littoral Cote d'Opale, France; University of Oklahoma, United States

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5:00PM *Characterisation and Identification of Rice Grains through Digital Image Analysis* [#7549]  
Dave Hobson, Robert Carter and Yong Yan  
University of Kent, United Kingdom

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## **Poster Session Tu4p: Measurement-Data Acquisition**

*Tuesday, May 1, 4:00PM-5:30PM, Room: Poster Hall*

*A New CMOS Integrable Oscillating Circuit for High-Value Wide- Range Resistive Sensors* [#7513]  
Alessandro Depari, Alessandra Flammini, Daniele Marioli, Andrea Taroni, Andrea De Marcellis, Giuseppe Ferri and Vincenzo Stornelli  
University of Brescia, Italy; University of L'Aquila, Italy

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*A novel architecture to implement low-cost ferrofluidic pumps* [#7462]  
Bruno Ando, Alberto Ascia, Salvatore Baglio and Nicola Pitrone  
DIEES-University of Catania, Italy

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*A smart color sensor based on a multi-Fuzzy Inference strategy* [#7464]  
Bruno Ando, Salvatore Baglio, Nicola Pitrone and Alberto Ascia  
DIEES-University of Catania, Italy

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*Data Acquisition and Sharing for a Distributed Intelligent DSM System* [#7383]  
Gregorio Andria and Vincenzo Di Lecce  
DIASS - Politecnico di Bari - V.le del Turismo 8, Italy

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*The 2D model for a highly adaptive EIT sensor and image reconstruction algorithms* [#7429]  
Zhang Cao, Huaxiang Wang, Wuliang Yin and Yong Yan  
Tianjin University, China; The University of Manchester, United Kingdom; University of Kent, United Kingdom

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*A Low-Cost CMOS Integrated Sensor Transducer Implemented as a Capacitance-to-Frequency Converter for Capacitive Measuring* [#7010]

Cheng-Ta Chiang, Chi-Shen Wang and Yu-Chung Huang

Industrial Technology Research Institute, Taiwan; National Chiao Tung University, Taiwan

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*Wireless Sensor Network for Selective Activity Monitoring In a Home for the Elderly* [#7293]

Gourab Sen Gupta, Subhas Mukhopadhyay, Michael Sutherland and Serge Demidenko

Singapore Polytechnic, Singapore; Massey University, New Zealand

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*Ant Colony-Based Reinforcement Learning Algorithm for Routing in Wireless Sensor Networks* [#7593]

Reza GhasemAghaei, Md. Abdur Rahman, Wail Gueaieb and Abdulmotaleb El Saddik

University of Ottawa, Canada

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*Improving GMR Magnetometer Sensor Uncertainty by Implementing an Automatic Procedure for Calibration and Adjustment* [#7640]

Andrea Bernieri, Luigi Ferrigno, Marco Laracca and Antonello Tamburrino

DAEIMI, University of Cassino, Italy

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*Identification of parameters in a Rogowski coil used for the measurement of partial discharges* [#7260]

Guillermo Robles, Marta Argueso, Javier Sanz, Romano Giannetti and Bernardo Tellini

Universidad Carlos III, Spain; Universidad Pontificia Comillas, Spain; Universita degli Studi di Pisa, Italy

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*A Flexible Optical Fiber Goniometer For Dynamic Angular Measurements* [#7520]

Giovanni Bucci, Fabrizio Ciancetta, Fabio Di Nicola, Massimiliano Donno and Elia Palange

University of L'Aquila, Italy

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*Evaluation of Plastic Film Thickness Gauge Using an X-ray Slit Beam* [#7267]

Fumio Tojo, Syunzou Hirakawa, Tosiyasu Toyoda, Masaru Iguchi, Yusuke Katayama, Tokoh Nishikubo, Hiroyuki Fujita and Mineo Itoh

Yamabun Electronics Co. Ltd., Japan; Grad. School of Kinki Univ., Japan

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*RF Capacitive Proximity Sensor for Safety Applications* [#7424]

Michele Norgia and Cesare Svelto

Politecnico di Milano, Italy

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*Performance measurements of CSMA/CA-based wireless sensor networks for industrial applications* [#7238]

Matteo Bertocco, Giovanni Gamba, Alessandro Sona and Stefano Vitturi  
University of Padova, Italy; Italian National Council of Research, IEIT-CNR, Italy

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*A Versatile Setup to Test and Program an Incremental Analog-to- Digital Converter* [#7142]

Carlos A. De La Cruz Blas, Antonio Lopez-Martin and Alfonso Carlosena  
Public University of Navarra. IEE, Campus Arrosa, Spain

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*High Resolution Signal Converter for Multimedia Systems* [#7427]

Yu-Cheng Fan, Arvin Chiang, Jiyin-Chang Jiang, Tsung-Chen Chi, Jan-Hung Shen and Yin-Te Hsieh  
National Taipei University of Technology, Taiwan

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*Time Base Error Characterization of a Data Recorder Aimed for Marine Seismology* [#7307]

Shahram Shariat-Panahi, Francisco Correa Alegria, Antoni Manuel-Lazaro and Antonio Cruz Serra  
Technical University of Catalonia (UPC), Spain; Technical University of Lisbon (IST), Portugal

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*Substrate Noise Analysis for Integrated Circuits Design* [#7578]

Henrique Jorge Quaresma and Antonio Cruz Serra  
Telecom. Institute/Instituto Superior Tecnico, Portugal

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*Fault Diagnosis On Board For Analog To Digital Converters* [#7207]

Lorenzo Ciani, Catelani Marcantonio and Gaetano Iuculano  
Universita' di Firenze, Italy

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*Stability Analyses of Higher-Order Delta-Sigma Modulators for Dual Sinusoidal Inputs* [#7233]

Jaswinder Lota, Mohammed Al-Janabi and Izzet Kale  
MIEEE, United Kingdom

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*Comparative Study between Continuous-Time Real and Quadrature Bandpass Delta Sigma Modulator for Multistandard Radio Receiver* [#7336]

Nejmeddine Jouda, Chiheb Rebai, Adel Ghazel and Dominique Dallet  
CIRTA'COM Research Unit, SUPCOM, Tunisia; IMS Laboratory, University of Bordeaux, France

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*Bandpass Sigma-Delta Modulator for Capacitive Pressure Sensor* [#7316]

Jiri Haze, Radimir Vrba, Lukas Fucik, Jiri Forejtek, Pavel Zavoral, M. Pavlik and Linus Michaeli  
Dept. of Microelectronics, FEEC, BUT Brno, Czech Republic

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*Posteriori frequency spectrum correction for test signal imperfections in ADC testing* [#7192]

David Slepicka, Dominique Dallet, Vladimir Shitikov and Francois Barbara  
Czech Technical University in Prague, FEE, Czech Republic; Laboratoire IXL, France; Schlumberger, France

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*Thermal Sigma-Delta Modulator: Anemometer Performance Analysis* [#7565]

Will Almeida, Georgina Freitas, Ligia Palma, Sebastian Catunda, Raimundo Freire, Francisco Santos, Amauri Oliveira and Hassan Aboushady  
Federal University of Campina Grande, Brazil; Federal University of Bahia, Brazil; Federal University of Maranhao, Brazil; University of Paris VI, France

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*A Constant Temperature Thermoresistive Sigma-Delta Anemometer* [#7567]

Will Almeida, Georgina Freitas, Ligia Palma, Sebastian Catunda, Raimundo Freire, Hassan Aboushady, Francisco Santos and Amauri Oliveira  
Federal University of Campina Grande, Brazil; Federal University of Bahia, Brazil; Federal University of Maranhao, Brazil; University of Paris VI, France

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*Improved Performance Linearization Technique for CMOS Differential Structure* [#7015]

Cosmin Popa  
UPB, Romania

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*Dynamic Reduction of Transients Duration in Delay-Equalized Chebyshev Filters* [#7025]

Jacek Piskorowski  
Szczecin University of Technology, Poland

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*An example of System on Chip design for biomedical applications: bruxism therapy* [#7582]

Arrigo Palumbo, Calogero Pace, Mauro Farella and Giuseppe Cocorullo  
DEIS, University of Calabria, Italy; University of Naples "Federico II", Italy

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*Optoelectronic Measurement Interface for System-on-Chip Debug* [#7185]

Pieter Sartain, Andrew Hopkins and Klaus McDonald-Maier  
University of Essex, United Kingdom

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*Development problems of large area, web accessible, environmental pollution monitoring system* [#7579]

Andrzej Michalski, Andrzej Kalicki, Zbigniew Staroszczyk and Piotr Pietruszka  
Warsaw University of Technology, Poland

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*Spectral Signature Classification Using A Support Vector Classifier For Real-Time Instrumentation* [#7321]

Shamim Nemati, Mark Yeary, Tian Yu, Yadong Wang and Yan Zhai  
University of Oklahoma, United States

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*A Framework for Sensory-based P2P Collaborative Environment* [#7562]

Md. Abdur Rahman, Md. Suruz Miah, Wail Gueaieb and Abdulmotaleb El Saddik  
University of Ottawa, Canada

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*Error Compensation of a Fast Digital Integrator for Magnetic Measurement at CERN* [#7603]

Pasquale Arpaia, Vitaliano Inglese, Giovanni Spiezia and Stefano Tiso  
University of Sannio, Dpt. of engineering., Italy; CERN AT/MTM, Switzerland; University of Naples, FEDERICO II. CERN, AT/MTM., Switzerland; CERN AT/MTM, Italy

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*A New Approach to Design and Optimisation of Pipeline A/D Converters* [#7372]

Konrad Jedrzejewski and Anatoliy Platonov  
Warsaw University of Technology, Poland

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*New application of Reflected GPS Signals L1/L2 observation Techniques with an Integrated GPS Receiver for Remote measurements and Digital Terrain Elevation Mapping* [#7285]

Lie-Chung Shen, Jyh-Ching Juang, Ching-Liang Tseng, Chia-Chyang Chang and Ching-Lang Tsai  
National Cheng Kung University, Taiwan; Yuda University, Taiwan; National Cheng Kung University, Taiwan

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*A Review of Commercial Energy Harvesters for Autonomous Sensors* [#7528]

Maria Teresa Penella and Manuel Gasulla  
Instrumentation, Sensors, Interfaces Group; UPC, Spain; Instrumentation, Sensors, Interfaces Group; UPC, Spain

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*Energy Consumption Measurement Technique for Automatic Instruction Set Characterization of Embedded Processors* [#7426]

Manuel Wendt, Matthias Grumer, C. Steger, R. Weib, U. Neffe and A. Muhlberger  
Institute for Technical Informatics, Austria

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*A low-power preamble detection methodology for packet based RF modems on all-digital sensor front-ends* [#7351]

Kiran Gunnam, Gwan Choi, Mark Yeary and Yan Zhai  
Texas AM University, United States; University of Oklahoma, United States

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*System for Measuring Power Supply Parameters with ZigBee Connectivity* [#7370]  
Jose Manuel Rodriguez Ascariz and Luciano Boquete  
Department of Electronics, University of Alcala, Spain

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*Analysis and Simulation of Jitter for High Speed Channels in VLSI Systems* [#7143]  
Kyung Ki Kim, Jing Huang, Yong-Bin Kim, Fabrizio Lombardi and Minsu Choi  
Northeastern University, United States; University of Missouri, Rolla, United States

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*Accurate Macro-modeling for Leakage Current for IDDQ Test* [#7144]  
Kyung Ki Kim, Yong-Bin Kim, Minsu Choi and Nohpill Park  
Northeastern University, United States; University of Missouri, Rolla, United States; Oklahoma State University, United States

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*BIST Design for CCD based Digital Imaging System* [#7609]  
Byoungjae Jin, Nohpill Park, Minsu Choi, Serge N.Demidenko and Fabrizio Lombardi  
Oklahoma State University, United States; University of Missouri- Rolla, United States; Northeastern University, United States

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## **Wednesday, May 2**

### **Special Session We1ab: Electrical Impedance Measurement Methods and Applications**

*Wednesday, May 2, 8:30AM-10:00AM, Room: Ballroom AB*  
*Chair: Ramon Pallas Areny*

8:30AM *Output Impedance Measurement in Power Sources and Conditioners* [#7379]  
Roberto E Serrano-Finetti and Ramon Pallas-Areny  
Technical University of Catalonia, Spain

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8:45AM *Bioimpedance Monitoring of Tissue Transplants* [#7402]  
Mart Min, Paul Annus, Raul Land, Toivo Paavle, Eero Haldre and Rein Ruus  
Department of Electronics, TUT, Estonia

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9:00AM *Method using bilinear transformation for measurement of impedance parameters of a multi-element two-terminal network* [#7319]  
Jerzy Hoja and Grzegorz Lentka  
Gdansk University of Technology, Poland

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9:15AM *Electrical impedance tomography with optimized square sensor* [#7168]  
Zhang Cao, Huaxiang Wang and Lijun Xu  
Tianjin University, China; Beihang University, China

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9:30AM *Dual Slope Resistance to Digital Converter* [#7523]  
Madhu Mohan, Bobby George and Jagadeesh Kumar  
Measurements Laboratory, IIT Madras, India

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### **Special Session We1c: System Identification Applied to Solve Measurement Problems: transfer function modelling**

*Wednesday, May 2, 8:30AM-10:00AM, Room: Ballroom C*  
*Chair: Johan Schoukens*

8:30AM *Asymptotic uncertainty of transfer function estimates using nonparametric noise models* [#7014]  
Rik Pintelon and Mei Hong  
Vrije Universiteit Brussel, dept. ELEC, Belgium; Uppsala University, dept. Inform. Techn., Sweden

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8:45AM *Stable approximations of Unstable Models* [#7140]

Tom D'haene, Rik Pintelon and Patrick Guillaume

Vrije Universiteit Brussel, department ELEC, Belgium; Vrije Universiteit Brussel, department MECH, Belgium

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9:00AM *Detection of Unmodeled Nonlinearities Using Correlation Methods* [#7408]

Martin Enqvist, Johan Schoukens and Rik Pintelon

Vrije Universiteit Brussel, Belgium

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9:15AM *Measuring the best linear approximation of a nonlinear system with uniformly frequency-distributed periodic signals* [#7313]

Tadeusz Pawel Dobrowiecki and Johan Schoukens

Budapest University of Technology and Economics, Hungary; Vrije Universiteit Brussel, Belgium

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9:30AM *Some Practical Applications of a Nonlinear Block Structure Identification Procedure* [#7322]

Lieve Lauwers, Johan Schoukens, Rik Pintelon, Wendy Van Moer and Liesbeth Gomme

Vrije Universiteit Brussel - ELEC, Belgium

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## **Special Session We1d: Measurement for Nanotechnology I**

Wednesday, May 2, 8:30AM-10:00AM, Room: Ballroom D

Chair: Jan Obrzut

8:30AM *CMOS Nanostructure with Auto-Programmable Thermal Loop and Superior-Order Curvature Corrected Technique* [#7016]

Cosmin Popa

UPB, Romania

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8:45AM *Hollow Fibers Integrated with Single Walled Carbon Nanotubes: Bandgap Modification and Chemical Sensing Capability* [#7117]

Marco Pisco, Marco Consales, Antonello Cutolo, Michele Penza, Patrizia Aversa, Stefania Campopiano, Michele Giordano and Andrea Cusano

Opt. Div. - Eng. Dep., University of Sannio, Italy; ENEA, C.R. Brindisi, Materials and New Tech, Italy;

Dept. for Tech., University of Naples, Parthenope, Italy; IMCB, CNR, Naples, Italy

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9:00AM *Dynamic Analysis of CdSe Quantum Dots Luminescent Emissions for Cyanide Detection* [#7165]

Marta Valledor, Juan Carlos Campo Rodriguez, Francisco Javier Ferrero, Martin M.T. Fernández-

Arguelles and A. Sanz-Medel

University of Oviedo, Spain

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9:15AM *A New Particle Filter Tracking Algorithm For DOA Sensor Systems* [#7211]  
Yan Zhai and Mark Yeary  
University of Oklahoma, United States

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9:30AM *Measurement of RF impedance of individual carbon nanotubes* [#7354]  
Jan Obrzut, Kalman Migler, Lifeng Dong and Jun Jiao  
NIST, United States; Portland State University, United States

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## **Session We1ef: Fiber Optics Measurements**

*Wednesday, May 2, 8:30AM-10:00AM, Room: Ballroom EF*  
*Chair: Tomasz R. Wolinski*

8:30AM *Fibre-optic rotational seismometer as device for detection the seismic rotational events* [#7660]  
Leszek R. Jaroszewicz and Zbigniew Krajewski  
Military University of Technology, Poland

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8:45AM *Concept Level Evaluation of the Optical Voltage and Current Sensors and an Arrayed Waveguide Grating for Aero-Electrical Systems' Applications* [#7452]  
Grzegorz Fusiek, Pawel Niewczas and James R. McDonald  
Strathclyde University, United Kingdom

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9:00AM *Integration of a Distributed Fiber Optic Current Sensor Setup for Lightning Detection in Wind Turbines* [#7082]  
Sebastian Kraemer, Fernando Puente Leon, Yaru Mendez Hernandez and Bastian Lewke  
TU Munich, Germany; GE Global Research, Germany

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9:15AM *Photonic Crystal Fiber Fluorometer: Consideration of Factors Associated With Maximum Fluorescent Collection* [#7077]  
Jianjun Ma and Wojtek J Bock  
Universite du Quebec en Outaouais, Canada

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9:30AM *Performance Evaluation of a Few- and Multimode Fiber-Optic Perimeter Sensor* [#7352]  
Rouven Arnaoudov, Wojtek Bock, Rosen Miletiev, Yuri Angelov and Tinko Eftimov  
Fac. of communications, Technical Univ. of Sofia, Bulgaria; Photonics Research Center, University of Quebec, Canada; Faculty of Physics, Plovdiv University, Bulgaria

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## **Session We1ws: Inverse Problems & Signal Reconstruction**

*Wednesday, May 2, 8:30AM-10:00AM, Room: Wawel-Syrena*

*Chair: Gabriele D'Antona*

8:30AM *A Faster and Cheaper Method of Implementing States Observers using Artificial Neural Networks* [#7362]

Ye Chow Kuang and Melanie Ooi  
Monash University, Malaysia

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8:45AM *Compensation of Coil Radial Offset in Single-Coil Measurement of Metal Tube Properties* [#7146]

Darko Vasic, Vedran Bilas and Davorin Ambrus  
University of Zagreb, Croatia

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9:00AM *TDR response properties and their use in the estimation of soil permittivity* [#7636]

Patrizia Savi, Ivan Maio and Igor Stievano  
Politecnico di Torino, Italy

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9:15AM *Multi-channel Digital Fringe Calibration for Structured Light Profilometers using Neural Networks* [#7038]

Matthew Baker, Jiangtao Xi and Joe Chicharo  
University of Wollongong, Australia

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9:30AM *New Pathways Towards the Enhancement of the Image Quality* [#7595]

George Giakos, Sriram Atreya Paturi, Praneeth Bathini, Srinivas Sukumar, K. Ambadipudi, D. Wagenar, V. Adya, Manisha Reddy and Keerthi Valluru  
University of Akron, United States; University of Akron, Uruguay

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## **Special Session We2ab: Sensor Networks for Environmental Protection**

*Wednesday, May 2, 10:30AM-12:00PM, Room: Ballroom AB*

*Chair: Frans C.A. Groen, Peter Wide*

10:30AM *Human-Computer Symbiotic Cooperation in Robot-Sensor Networks* [#7220]

Vladimir Hinic, Emil Petriu and Thomas E. Whalen  
SITE, University of Ottawa, Canada; CRC, Ottawa, Canada

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10:45AM *Using a Sensor Source Intelligence Cell to Connect and Distribute Visual Information from a Commercial Game Engine in a Disaster Management Exercise* [#7304]

Martin Persson and Peter Wide  
Saab Systems / Orebro University, Sweden; Orebro University, Sweden

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11:00AM *Causal Bayesian Networks for Robust and Efficient Fusion of Information Obtained from Sensors and Humans* [#7570]

Gregor Pavlin, Maris Marinus and Frans Groen

Thales Research and Technology, Netherlands; University of Amsterdam, Netherlands

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11:15AM *Scaling Issues for Energy and Communication in Large Networks of Small Sensors* [#7591]

Mel Siegel

Carnegie Mellon University, United States

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11:30AM *The Design of a Web-Sensor Network for Environmental Monitoring and Remote Control Applications by Data Fusion Techniques* [#7542]

Claudio De Capua, Stefano De Falco and Rosario Morello

DIMET-University Mediterranea of Reggio Calabria, Italy;

DIEL-University of Naples "Federico II", Italy

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### **Special Session We2c: System Identification Applied to Solve Measurement Problems: (non)parametric methods**

*Wednesday, May 2, 10:30AM-12:00PM, Room: Ballroom C*

*Chair: Rik Pintelon*

10:30AM *Effects of overlapping and windowing on the estimates of frequency response functions of linear systems with random input signals* [#7131]

Dhammika Widanage, John Douce and Keith Godfrey

School of Engineering, University of Warwick, United Kingdom

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10:45AM *Frequency domain Errors-In-Variables estimation of linear dynamic systems using data from overlapping sub-records* [#7019]

Kurt Barbe, Johan Schoukens and Rik Pintelon

Vrije Universiteit Brussel, dep. ELEC, Belgium

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11:00AM *Adaptive smoothing of Frequency Response Functions in Digital Spectral Analysers* [#7382]

Jerome Antoni and Johan Schoukens

University of Technology of Compiègne, France; Vrije Universiteit Brussel, Belgium

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11:15AM *Transfer Function Estimation of Digital Subscriber Lines with Single Ended Line Testing* [#7092]

Carine Neus, Patrick Boets and Leo Van Biesen

Vrije Universiteit Brussel, Belgium

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11:30AM *Pseudorandom Maximum Length Signal Design with Bias Compensation Least Squares Estimation for System Identification* [#7145]

Mathias Fui Lin Foo, Ai Hui Tan and Kartik Prasad Basu  
Faculty of Engineering, Multimedia University, Malaysia

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## **Special Session We2d: Measurement for Nanotechnology II**

*Wednesday, May 2, 10:30AM-12:00PM, Room: Ballroom D*  
*Chair: Jan Obrzut*

10:30AM *Particle Size Influence on Effective Permittivity of Particle- Gas Mixture with Particles Agglomeration: Experimental Study* [#7365]

Xiaomin Li and Lijun Xu  
University of Greenwich, United Kingdom; Beihang University, China

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10:45AM *Quantitative Measurement of Electromagnetic Distortions in Scanning Electron Microscope (SEM)* [#7456]

Mariusz Pluska, Lukasz Oskwarek, Remigiusz Rak and Andrzej Czerwinski  
Warsaw University of Technology, Poland; Institute of Electron Technology, Poland

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11:00AM *Characterization of Single and Multiwall Carbon Nanotubes at Microwave Frequencies* [#7566]

Nawaf Almoayed, Usman Khan, Mahmut Obol, Sanju Gupta and Mohammed Afsar  
Tufts University, United States; University of Missouri, United States

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11:15AM *Measurement uncertainty in nanometrology: leveraging attributes of TEM and CD AFM* [#7592]  
Hao-Chih Liu, Gregory Dahlen, Marc Osborn, Jason Osborne, Lars Mininni, Bryan Tracy and Amalia del Rosario

Veeco Instruments, Inc., United States; Spansion LLC., United States

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## **Session We2ef: Optical Measurements**

*Wednesday, May 2, 10:30AM-12:00PM, Room: Ballroom EF*  
*Chair: Wojtek Bock*

10:30AM *Timing Calibration of the NEMO phase 1* [#7555]

Martino Ruppi  
INFN, Sezione di Bari and Dipartimento di Fisica, Italy

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10:45AM *Jitter Improvement of Time-Resolved Photoelectric Laser Stimulation for Dynamic Imaging of Integrated Circuits* [#7176]

Alexandre Douin, Vincent Pouget, Dean Lewis, Pascal Fouillat and Philippe Perdu  
IXL Laboratory, France; French Space Agency (CNES), France

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11:00AM *Crop and weed image recognition by morphological operations and ANN model* [#7297]

Jiazhi Pan, Min Huang and Yong He  
Zhejiang University, China

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11:15AM *Comparison of Various Algorithms for Phase Unwrapping in Optical Phase Microscopy* [#7510]

Bernd Arminger, Bettina Heise and Bernhard Zagar  
University of Linz, Austria

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11:30AM *Monolithically Integrated Optical Distance Measurement Sensor with Double-Cathode Photodetector* [#7047]

Klaus Oberhauser, Gerald Zach, Alexander Nemecek and Horst Zimmermann  
Vienna University of Technology, Austria

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## **Session We2ws: Electrical & Power Measurements 1**

Wednesday, May 2, 10:30AM-12:00PM, Room: Wawel-Syrena  
Chair: Janusz Mindykowski

10:30AM *20-A to 100-A AC-DC Coaxial Current Shunts for 100 kHz Frequency Range* [#7175]

Piotr Filipski, Michael Boecker and Martin Garcocz  
National Research Council, Canada; Bundesamt für Eich- und Vermessungswesen, Austria

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10:45AM *Four terminal-pair inductance comparison between INRIM and CTU* [#7158]

Luca Callegaro, Vincenzo D'Elia and Jaroslav Bohacek  
Istituto Nazionale di Ricerca Metrologica, Italy; Czech Technical University in Prague, Czech Republic

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11:00AM *Two-channel amplifier for high-sensitivity voltage noise measurements* [#7066]

Felice Crupi, Calogero Pace and Gino Giusi  
DEIS, University of Calabria, Italy

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11:15AM *Measurement of Immunity of a Digital Acquisition System to Conducted Disturbances* [#7147]

Giovanni Betta, Domenico Capriglione, Carmine Landi and Nicola Pasquino  
University of Cassino, Italy; Second University of Naples, Italy; University of Naples Federico II, Italy

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11:30AM *Measurement of the Frequency Characteristic of Shunt with the Method of Two Voltmeters* [#7468]

Dusan Agrez  
University of Ljubljana, Slovenia

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## **Poster Session We2p: Measurement-Data Processing**

*Wednesday, May 2, 10:30AM-12:00PM, Room: Poster Hall*

*Sequential Dual Filter Based Smoothing Framework for Integrated Navigation Systems* [#7157]

Feng He and Lenan Wu  
Southeast University, China

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*Multisensor unscented filtering for GPS-based navigation systems* [#7332]

Christophe Boucher, Abdelkabar Lahrech and Jean-Charles Noyer  
LASL - ULCO, France

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*Timing and Ranging Models Based on OFDM Synchronization* [#7155]

Feng He and Lenan Wu  
Southeast University, China

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*Fractional-Order FIR Differentiators with Optimum Noise Attenuation* [#7219]

Olli Vainio, Raija Lehto and Tapio Saramaki  
Tampere University of Technology, Finland

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*Location and estimation parameters of weak wave packets in noise* [#7096]

Olga Bunyak and Yuriy Bunyak  
Vinnitsa National Technical University, student, Ukraine; InnoVinn Inc, Vinnitsa, Ukraine

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*New interpolation methods for image-based sub-pixel displacement measurement based on correlation* [#7387]

Lubomir Riha, Jan Fischer, Radislav Smid and Adam Docekal  
Dept. of Measurement, Czech Technical University, Czech Republic

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*A Kalman Filter-Based Method for Real-Time Tracking of I/Q Impairments in Digital Communication Transmitters* [#7669]

Leopoldo Angrisani, Rosario Schiano Lo Moriello and Michele Vadursi  
University of Naples Federico II, Italy; University of Naples "Parthenope", Italy

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*High Performance Real-time Object Detecting and Tracking System for Multiple Moving Targets* [#7525]  
Chih-hsien Kung, Chih-ming Kung and Jung-ping Wang  
Chang-Jung Christian University, Taiwan; Meiho Institute of Technology, Taiwan

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*CCD Camera Instrumental Background Estimation Algorithm* [#7407]  
Dominik Sankowski and Anna Fabijanska  
Technical University of Lodz, Poland

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*Heuristic Tomographic Reconstruction of Coded Aperture Images* [#7643]  
Yen-Wei Chen  
Ritsumeikan University, Japan

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*Low Cost Microscope Add-On System for Subpixel Resolution Displacement Measurement* [#7404]  
Vygantas Augutis, Darius Gailius and Pranas Kuzas  
Kaunas University of Technology, Lithuania

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*An Integrated Dynamic Image Stabilizer Applied to Zooming Systems* [#7200]  
Angelos Amanatiadis and Ioannis Andreadis  
Democritus University of Thrace, Greece

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*A real time video processing based surveillance system for early fire and flood detection* [#7043]  
ChinLun Lai, JieCi Yang and YiHua Chen  
Oriental institute of technology, Taiwan

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*Neural Reconstruction of a Sensor Input Signal* [#7227]  
Jerzy Jakubiec, Piotr Makowski and Jerzy Roj  
Silesian University of Technology, Poland

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*An Adaptive Multigrid Method for EIT* [#7089]  
Bo Zhao, Huaxiang Wang, Li Hu, Lijun Xu, and Yong Yan  
Tianjin University, China; Beihang University, China

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*Reconstruction of nonlinear deformed periodic signals using inverse circular parametric operators* [#7239]  
Radoslaw Klosinski and Miroslaw Koziol  
University of Zielona Gora, Poland

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*A Novel Approach for Dynamic Bayesian Prior Selection in ill- Conditioned Measurement Models* [#7646]  
Gabriele D'Antona and Luca Rocca  
Politecnico di Milano, Italy

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*A Simple Algorithm for Solving a Two-dimensional Nonlinear Measurement Problem* [#7435]  
Wieslaw Domanski and Jan Zakrzewski  
The Silesian University of Technology, Poland

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*A novel approach to thermal tests for flash memories reliability improvement based on DoE method* [#7248]  
Marcantonio Catelani, Lorenzo Ciani, Valeria Scarano, Roberto Singuaroli and Guido Bacis  
University of Florence, Italy; STMicroelectronics, Italy

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*Simulations and analysis of disturbances in power systems* [#7536]  
Grzegorz Brodzinski, Andrzej Majkowski and Remigiusz J. Rak  
Warsaw University of Technology, Poland

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*Voltage Waveform Pattern Selection for Power Quality Event Classification* [#7073]  
Omer Nezh Gerek, Dogan Gokhan Ece and Atalay Barkana  
Anadolu University, Turkey

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*Nozzles Classification in Water Jet Systems* [#7634]  
Massimiliano Annoni, Loredana Cristaldi, Massimo Lazzaroni and Stefano Ferrari  
Politecnico di Milano, Italy; Universita' degli Studi di Milano, Italy

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*Discrete Wavelet Transform In Automatic ECG Signal Analysis* [#7455]  
Adam Josko  
Warsaw University of Technology, Poland

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*Multiple Signal Detection and Measurement Using a Configurable Wideband Digital Receiver* [#7638]  
Henry Chen and Kiran George  
Wright State University, United States

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*Short Term Load Forecasting Model in the Power System Using Ensemble of Predictors* [#7174]  
Krzysztof Siwek and Stanislaw Osowski  
Warsaw University of Technology, Poland

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*Development of large software for the ADC testing* [#7574]

Petr Cesak and Jaroslav Rztocil

Czech Technical University in Prague, Czech Republic

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*Substrate Noise Isolation Experiments in a 0.18um 1P6M Triple-well CMOS Process on a Lightly Doped Substrate* [#7138]

Rosa Maria Vinella, Geert Van der Plas, Charlotte Soens, Maria Rizzi and Beniamino Castagnolo

DEE Politecnico di Bari, Italy; Desics/WL IMEC, Belgium

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*Low-cost weather sensor based on thermal impedance measurements* [#7560]

Heinrich Ruser and Michael Horn

University of Bundeswehr Muenchen, Neubiberg, Germany

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*Diagnosis of Muscle Condition on the Basis of MUP Spectral Analysis* [#7036]

Andrzej Dobrowolski, Piotr Komur and Kazimierz Tomczykiewicz

Military University of Technology, Warsaw, Poland; Military Institute of Health Service, Warsaw, Poland

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### **Session We3ab: Automated Testing and Monitoring**

*Wednesday, May 2, 2:00PM-3:30PM, Room: Ballroom AB*

*Chair: Marcantonio Catelani*

*2:00PM Open Architecture Software Design for Online Spindle Health Monitoring* [#7551]

Li Zhang, Ruqiang Yan, Robert X. Gao and Kang B. Lee

University of Massachusetts Amherst, United States; National Institute of Standards and Technology, United States

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*2:15PM High Accuracy Semiautomatic Calibration of Industrial RTDs* [#7605]

Vladimir Gureyev and Alexey L'vov

Saratov State Technical University, Russian Federation

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*2:30PM Statistical estimated parameter for pipeline condition monitoring using acoustic emission* [#7148]

Tonphong Kaewkongka and Jirapong Lim

Chulalongkorn University, Thailand; King Mongkut Institute of Technology, North Bang, Thailand

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2:45PM *A software framework for flexible magnetic measurements at CERN* [#7680]  
Pasquale Arpaia, Luca Bottura, Marco Buzio, Domenico Della Ratta, Laurent Deniau, Vitaliano Inglese, Giovanni Spiezia, Stefano Tiso and Louis Walckiers  
University of Sannio, Dpt. of engineering, BN, Italy; CERN AT-MTM, Switzerland; University of Naples, FEDERICO II. CERN, AT/MTM., Italy

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3:00PM *On-line Vibrations Characterization of a Moving Flexible Web with a Fast Structured Lighting Stereovision System* [#7060]  
Xavier Maurice, Christophe Doignon and Dominique Knittel  
Department of Computer Science, INSA Lyon, France; University of Strasbourg, France

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### **Special Session We3c: System Identification Applied to Solve Measurement Problems: signal modelling**

*Wednesday, May 2, 2:00PM-3:30PM, Room: Ballroom C*  
*Chair: Johan Schoukens*

2:00PM *Spectral Estimation from Irregularly Sampled Data for Frequencies Far Above the Mean Data Rate* [#7108]  
Piet M.T. Broersen  
Department of Multi Scale Physics, Delft, Netherlands

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2:15PM *Cramer-Rao Bounds and Non-Linear Least Squares for a Seven Parameter Dual Channel Sinewave Model* [#7037]  
Peter Handel  
Royal Institute of Technology, Sweden

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2:30PM *Length and Quality of Lagged Product Autocorrelation Estimates* [#7044]  
Piet M.T. Broersen  
Dept of Multi Scale Physics, Delft University, Netherlands

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2:45PM *Parameter estimation of spectral components of a signal: comparison of techniques* [#7330]  
Consolatina Liguori, Vincenzo Paciello and Alfredo Paolillo  
University of Salerno, Italy

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3:00PM *Multichannel Autoregressive Order Selection in Practice* [#7062]  
Piet M.T. Broersen  
Dept of Multi Scale Physics, Delft University, Netherlands

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## **Special Session We3d: Measurement Applications of Intelligent Data Processing I**

*Wednesday, May 2, 2:00PM-3:30PM, Room: Ballroom D*

*Chair: Annamaria R. Varkonyi-Koczy, Fabrizio Russo*

*2:00PM Extraction of 3D Features from Complex Environments in Visual Tracking Applications [#7524]*

Marta Marron, Juan Carlos Garcia, Miguel Angel Sotelo, Daniel Pizarro Perez and Ignacio Bravo Munyoz  
Dpt. de Electronica, Universidad de Alcala, Spain

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*2:15PM 3D Head Tracking and Facial Expression Recovery using an Anthropometric Muscle-Based Active Appearance Model [#7186]*

Marius Cordea, Emil Petriu and Dorina Petriu  
University of Ottawa, Canada; Carleton University, Canada

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*2:30PM Support Vector Machine and Genetic Algorithm for Efficient Blood Cell Recognition [#7153]*

Stanislaw Osowski, Robert Siroic, Tomasz Markiewicz and Krzysztof Siwek  
Warsaw University of Technology, Poland

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*2:45PM Robot Vision for RT-Middleware Framework [#7627]*

Gabor Sziebig, Andor Gaudia, Peter Korondi, Noriaki Ando and Bjorn Solvang  
Budapest University of Technology and Economics, Hungary;  
National Institute of Advanced Industrial Science, Japan;  
Narvik University College, Norway

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*3:00PM Detection of Residual Salinity on Road Surface Using Neural Network [#7569]*

Muneo Yamada, Tetsuya Tanizaki, Koji Ueda and Hiroshi Yasukawa  
Nagoya Electric Works Co., Japan; Aichi Prefectural University, Japan

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## **Session We3ef: Sensors & Transducers I**

*Wednesday, May 2, 2:00PM-3:30PM, Room: Ballroom EF*

*Chair: Ryszard Jachowicz*

*2:00PM New electro-optic sensor architecture for temperature measurements [#7572]*

Remy Claverie, Jean Paul Salvestrini and Marc Fontana  
LMOPS - University of METZ - UMR CNRS 7132, France; Dida-Concept - LMOPS - University of METZ - UMR, France

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*2:15PM A self-resonant MEMS-based electrometer [#7557]*

Timothy Denison, Kent Lundberg, Jinbo Kuang and John Shafran  
Keeling Flight Hardware, United States; Analog Devices, United States

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2:30PM *Switched Capacitor Sigma Delta Capacitance to Digital Converter Suitable for Differential Capacitive Sensors* [#7357]

Boby George, Saurabh Agrawal and V. Jagadeesh Kumar  
Dept. of EE, IIT Madras, India

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2:45PM *Enhanced vibrating wire strain sensor* [#7393]

Dalibor Kuhinek and Igor Zoric  
University of Zagreb, Faculty of Mining, Geology, Croatia

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3:00PM *A low-voltage bootstrapping technique for capacitive MEMS sensors interface* [#7503]

Syed Arsalan Jawed, Massimo Gottardi, Nicola Massari and Andrea Baschirotto  
ITC-Irst, Italy; Universita` di Lecce, Italy

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## **Session We3ws: Electrical & Power Measurements II**

*Wednesday, May 2, 2:00PM-3:30PM, Room: Wawel-Syrena*  
*Chair: Pedro Silva Girao*

2:00PM *A Procedure For Extracting 1/f Noise From Random Telegraph Signals* [#7315]

Gino Giusi, Felice Crupi and Calogero Pace  
DEIS, University of Calabria, Italy

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2:15PM *Detection of Flicker Caused by High-frequency Interharmonics* [#7121]

Taekhyun Kim, Adam Wang, Edward J. Powers, W. Mack Grady and Ari Arapostathis  
ECE, The University of Texas at Austin, United States; EE, Stanford University, United States

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2:30PM *Broadband Voltage Transducer with Optically Insulated Output for Power Quality Analyses* [#7401]

Antonio Delle Femine, Daniele Gallo, Carmine Landi and Mario Luiso  
Seconda Universita' di Napoli, Italy

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2:45PM *The metrological characterization of the static meters for reactive energy in the presence of harmonic distortion* [#7417]

Antonio Cataliotti, Valentina Cosentino and Salvatore Nuccio  
Universita' di Palermo, Italy

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3:00PM *A Fuzzy method for the identification of the sources producing harmonic pollution in the electric network* [#7328]

Alessandro Ferrero, Simona Salicone and Grazia Todeschini  
Politecnico di Milano - Milano, Italy; Politecnico di Milano - Milano, Italy

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## **Plenary Poster Session We4p: Plenary Poster Session**

*Wednesday, May 2, 4:00PM-5:30PM, Room: Poster Hall*

*Investigations on Modelling for Sensor Systems with Varied Excitation* [#7656]

Olfa Kanoun  
University of Kassel, Germany

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*Characteristics of High-Speed Silicon Carbide (SiC) Transistor* [#7650]

Johnson Asumadu and James Scofield  
Western Michigan University, Kalamazoo, MI 49008, United States; WPAFB, Dayton, OH 45433, United States

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*Error estimates derived from the data for least-squares spline fitting* [#7271]

Jerome Blair  
National Security Technologies, LLC, United States

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*Symbolic Computation for Evaluation of Measurement Uncertainty* [#7601]

Peng Wei, Qing Ping Yang, Barry Jones and Mohd Rizal Salleh  
Brunel University, United Kingdom

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*Estimating Vegetation Water Content with Wireless Sensor Network Communication Signals* [#7674]

Joao Giacomini, Flavio Vasconcelos and Elson Silva  
Universidade Federal de Lavras, Brazil; Universidade Federal de Minas Gerais, Brazil

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*A Low-Cost Ultra-Wideband Indoor Ranging Technique* [#7399]

Alessio De Angelis, Marco Dionigi, Antonio Moschitta and Paolo Carbone  
University of Perugia, DIEI, Italy

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*Performance Characterization of a Method for Locating Faults in Power Distribution Networks* [#7119]

Lorenzo Peretto, Renato Sasdelli, Elisa Scala and Roberto Tinarelli  
University of Bologna, Italy

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*GPS-based System for the Measurement of Synchronized Harmonic Phasors* [#7369]  
Andrea Carta, Nicola Locci and Carlo Muscas  
University of Cagliari, Italy

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*Digital Imaging Based On-Line Particle Sizing of 'Green' Biomass Fuels in Power Generation* [#7132]  
Robert Carter and Yong Yan  
University of Kent, United Kingdom

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*Fouling Detection Based on Analyses of Vibrations with the Hammer Impact Test* [#7046]  
Jaidilson Jo Silva, Antonio Marcus Nogueira Lima, Jose Sergio Rocha Neto and Franz Helmut Neff  
Federal University of Campina Grande, Brazil

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*Bearing Fault Detection via Wavelet Packet Decomposition with Spectral Postprocessing* [#7500]  
Levent Eren, Michael Devaney and Kaptan Teotrakool  
Bahcesehir University, Turkey; University of Missouri, United States

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*Impact of industrial environments on the Pc-based measurements* [#7478]  
Salvatore Nuccio, Ciro Spataro and Giovanni Tine  
Universita degli Studi di Palermo, Italy; CNR, Italy

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*In-vivo Test Procedure and Instrument Characterization for EIS-Based Diagnosis of Prosthesis Osseointegration* [#7533]  
Pasquale Arpaia, Fabrizio Clemente and Carmine Romanucci  
Dip. di Ingegneria, Universita' del Sannio, Italy; Consiglio Nazionale delle Ricerche, ISIB, Italy

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*Signal Cancellation Technique for Testing High-end Digital-to-Analog Converters* [#7027]  
Fang Xu  
Teradyne, United States

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*An R-2R Ladder-Based Architecture for High Linearity DACs* [#7466]  
Kostas Efstathiou and Dimitris Karadimas  
Faculty Dept. ECE, University of Patras, Greece, Greece; Ph.D. Student, ECE, University of Patras, Greece, Greece

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*Direct Interface for Magnetoresistive Sensors* [#7386]  
Ernesto Sifuentes, Oscar Casas and Ramon Pallas-Areny  
Technical University of Catalonia (UPC), Spain

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*Non-linearity in high gain CMOS buffer amplifiers for CCD processor applications* [#7093]  
Pierre Laquerre, Olivier Bernal and Marc Lescure  
Laboratoire d'electronique de l'Enseeiht (LEN7), France

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*A 20 uA Front-End for Three-Axis Capacitive Microaccelerometers* [#7425]  
Mika Kamarainen, Mikko Saukoski, Matti Paavola and Kari Halonen  
Helsinki University of Technology, Finland

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*An Impact Technique for Wide Band Characterization of the Piezoelectric Accelerometers* [#7497]  
Marco Massarotto, Alfonso Carlosena, Sergio Garriz and Jesus Pintor  
Public Univ. of Navarra(ES). Univ. of Brescia(I), Italy; Public University of Navarra (ES)., Spain

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*Implementation-Efficient Maximum-Period Nonlinear Congruential Generators* [#7463]  
Tommaso Addabbo, Massimo Alioto, Ada Fort, Marco Mugnaini, Santina Rocchi and Valerio Vignoli  
University of Siena, Italy

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*Nondestructive measurement of the acidity of strawberry based on wavelet transform and partial least squares* [#7299]  
Yongni Shao and Yong He  
Zhejiang University, China

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*Motion Artifact Reduction in Photoplethysmographic Signals using Singular Value Decomposition* [#7518]  
K. Ashoka Reddy and V. Jagadeesh Kumar  
Dept of EE, IIT madras, India, India; Dept of EE, IIT Madras, India, India

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*A Generic ASIC Architecture for Real Time Time-Frequency Analysis of Non-stationary Large Bandwidth Signals* [#7487]  
Ludovic Noury, Francois Durbin, Habib Mehrez and Andre Tissot  
University Pierre et Marie Curie - LIP6/SOC lab, France; CEA DAM/DIF, France

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*Spectral Observers for Unevenly Sampled Data* [#7418]  
Karoly Molnar and Gabor Peceli  
Budapest University of Technology and Economics, Hungary

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*Configurable and Expandable FFT Processor for Wideband Communication* [#7633]  
Henry Chen and Kiran George  
Wright State University, United States

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*Simultaneous Removal of Harmonic Interference and White Noise by Combining Multi-Rate Signal Processing and Wavelet Denoising Techniques* [#7363]

Jun Han, Ying Hao and Lijun Xu

Capital Normal University, China; Tianjin University, China; Beihang University, China

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*A Resource-Constrained Sensor Dynamic Compensation Using a Learning-from-Examples Approach* [#7482]

Anna Marconato, Mingqing Hu, Christian Marzadro, Andrea Boni and Dario Petri

University of Trento, Italy

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*Concurrent monitoring of PCI bus transactions for timely detection of errors initiated by FPGA-based applications* [#7589]

Nikolaos Bartzoudis and Klaus McDonald-Maier

University of Essex, United Kingdom

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*Application of Genetic Algorithms for Run-Time Reconfiguration Using Flexible Bus-Macros* [#7661]

Carlos Nahas and Voicu Z. Groza

SITE, University of Ottawa, Canada

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*Busbar Current Measurement in Induction Heating Furnaces Using a Pick-Up Coil* [#7553]

Peter Tant, Dietrich Hectors, Koen Van Reusel, Johan Driesen and Geert Deconinck

KULeuven ESAT-ELECTA, Belgium

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*Planar Rogowski Coil Current Transducer Used for Three-Phase Plate-form Bus-Bars* [#7058]

Peng Wang, Guixin Zhang, Xiaomei Zhu, Chengmu Luo

Tsinghua University, China Tsinghua University, China Tsinghua University, China Tsinghua University, China Tsinghua University, China

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*Practical Application of Optical Instrument Transducer Used for the measurement of Rotor's Voltage and Current in Power Generator* [#7059]

Peng Wang, Guixin Zhang, Xiaomei Zhu and Chengmu Luo

Tsinghua University, China; Tsinghua Universit, China

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*Optical Micro-current Transducer for the Measurement of Corona Discharge Current Under High Voltage Environment* [#7063]

Peng Wang, Guixin Zhang, Jun Zhou and Chen Gu

Tsinghua University, China; China Electric Power Research Institute, China

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*Compensation of Current Transformers* [#7668]

Aldo Baccigalupi and Annalisa Liccardo

DIS-University Federico II of Naples, Italy; DIEL-University Federico II of Naples, Italy

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*Detection of Disturbing Loads in Distorted and/or Unbalanced Power Systems: a Technique Based on a Comparison among Nonactive Powers* [#7419]

Pietro Vincenzo Barbaro, Antonio Cataliotti, Valentina Cosentino and Salvatore Nuccio

Universita' di Palermo, Italy

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*Measurement of Asymmetric Minor Loops in Soft Ferrites Up to Medium Frequencies* [#7222]

Santiago Lizon-Martinez, Bernardo Tellini, Romano Giannetti and Guillermo Robles

Universidad Pontificia Comillas de Madrid, Spain; Universita degli Studi di Pisa, Italy; Universidad Carlos III Madrid, Spain

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*Automatic System to Measure Complex Permittivity and Permeability using Cavity Perturbation Techniques* [#7013]

Cevdet Akyel, Yan Ye, Andrey Sklyuyev and Petru Ciureanu

Ecole Polytechnique Montreal, Departement of Ele, Canada; Ecole Polytechnique Montreal, Departement of Eng, Canada

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*A Microcontroller-Based Microwave Measurement System for Permittivity Determination of Fresh Cement-Based Materials* [#7684]

Ugur Cem Hasar

Ataturk University, Turkey

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*Calibration, Measurement and Error Analysis of Optical Temperature Measurement via Laser Induced Fluorescence* [#7530]

Matthew Harker and Paul O'Leary

University of Leoben, Austria

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*Remote Measurement of Temperature in the Presence of a Strong Magnetic Field* [#7428]

Scott Lord, Samara Firebaugh and Andrew Smith

United States Naval Academy, United States

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*Estimating Viscosity and Density of Ternary Solution Based on Least-Squares B-Spline Approximation* [#7101]

Guo Wei, Jian Liu, Jinwei Sun and Katsunori Shida

Harbin Institute of Technology, China; Saga University, Japan

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*Empirical Investigation on Time Dispersion of Microwave Electron Device Characteristics under Nonlinear Dynamic Operating Conditions* [#7491]

Antonio Raffo, Valeria Di Giacomo, Pier Andrea Traverso, Alberto Santarelli and Giorgio Vannini  
University of Ferrara, Italy; University of Bologna, Italy

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*A Highly Flexible Measurement Set-Up for the LF Noise Up-Conversion and Phase-Noise Performance Characterization of Microwave Electron Devices* [#7496]

Corrado Florian and Pier Andrea Traverso  
University of Bologna, Italy

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*Quadrature Bridge for R--C Comparisons based on Polyphase Digital Synthesis* [#7405]

Bruno Trinchera, Luca Callegaro and Vincenzo D'Elia  
Istituto Nazionale di Ricerca Metrologica, Italy

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*Improving INFORM calculation method on permanent magnet synchronous machines* [#7348]

Andras Zentai and Tamas Daboczi  
ThyssenKrupp Nothelfer Kft. and Budapest Uni ..., Hungary;  
Budapest University of Technology and Economics, Hungary

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*Measurement of acoustic output of ultrasound instrumentation for interstitial thermal therapy* [#7206]

Boguslaw J Jarosz  
Ottawa-Carleton Inst. Physics, Carleton Univ., Canada

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*Self-calibrating Scalable Research Platform for Ultrasonic Measurements in Chemical and Biological Reactors* [#7151]

Alexander Kalashnikov, Vladimir Ivchenko, Richard Challis and Wei Chen  
University of Nottingham, United Kingdom

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*Sensing applications of photonic crystal fibers infiltrated with liquid crystals* [#7657]

Aleksandra Czapla, Tomasz Wolinski, Slawomir Ertman, Katarzyna Nowecka, Marzena Tefelska, Piotr Lesia, Andrzej Domanski, Jan Wojcik, Edward Nowinowski-Kruszelnicki and Roman Dabrowski  
Warsaw University of Technology, Koszykowa 75, Poland; Maria Curie Skłodowska University, Lublin, Poland; Military University of Technology, Warsaw, Poland

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*Tunable highly-birefringent Photonic Liquid Crystal Fibre* [#7663]

Slawomir Ertman, Aleksandra Czapla, Katarzyna Nowecka, Piotr Lesiak, Andrzej Domanski, Tomasz Wolinski and Roman Dabrowski  
Warsaw University of Technology, Poland; Military University of Technology, Poland

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*An improved criterion for inverse-model-based calibration of spectrophotometric transducers* [#7667]  
Andrzej Miekina and Roman Z. Morawski  
Institute of Radioelectronics WUT, Poland

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## **Thursday, May 3**

### **Special Session Th1ab: Reliable Design and Test of System-on-Chip - Instrumentation and Measurement Perspectives I**

*Thursday, May 3, 8:30AM-10:00AM, Room: Ballroom AB*

*Chair: Nohpill Park*

8:30AM *Special Session Opening Technical Talk "Taming the electronic beast: design and test for multimillion gate ICs"*

Serge Demidenko

Massey Universtiy Wellington Campus, New Zeland

8:45AM *VLSI Circuit Test Vector Compression Technique* [#7181]

Satyendra Biswas, Sunil R. Das and Altaf Hossain

Georgia Southern University, United States; University of Ottawa (and Troy University), Canada;

University of Ottawa, Canada

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9:00AM *Promising Complex ASIC Design Verification Methodology* [#7284]

Mansour H. Assaf, Sunil R. Das, Wael Hermas and Wen-Ben Jone

University of Trinidad and Tobago, Trinidad; Troy University (and University of Ottawa), United States;

Zoran Corporation, United States; University of Cincinnati, United States

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9:15AM *An Analog Checker with Programmable Adaptive Error Threshold* [#7135]

Amit Laknaur, Rui Xiao and Haibo Wang

Southern Illinois University, Carbondale, IL., United States

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9:30AM *Model-based test for analog integrated circuits* [#7139]

Lee Barford, Nick Tufillaro, Stan Jefferson and Ajay Khoche

Agilent Laboratories, United States; Verigy, United States

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### **Special Session Th1c: Instrumentation and Measurement Methods for Reliability, Testing and Fault Diagnosis**

*Thursday, May 3, 8:30AM-10:00AM, Room: Ballroom C*

*Chair: Marcantonio Catelani*

8:30AM *Environmental Stress Screening for electronic equipment by random vibration: a critical approach to reliability estimation and planning* [#7247]

Marcantonio Catelani, Valeria Scarano and Iacopo Trotta

University of Florence, Italy; Firenze Tecnologia, Italy

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8:45AM *Definition of safety performances for an electronic equipment used on rolling stock* [#7305]  
Marcantonio Catelani, Lorenzo Ciani, Marco Mugnaini, Valeria Scarano and Roberto Singuaroli  
Universita' di Firenze, Italy; Universita' di Siena, Italy

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9:00AM *Employing a Fuzzy Approach to the Fault Diagnosis of Analog Parts of Electronic Embedded Systems* [#7072]  
Zbigniew Czaja and Dariusz Zaleski  
Gdansk University of Technology, Faculty of ETI, Poland

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9:15AM *Application of the Graph Clustering Algorithm to Analog Systems Diagnostics* [#7396]  
Piotr Bilski  
Warsaw Agricultural University, Poland

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9:30AM *Analog Neural Network Design for Real-Time Surface Detection with a Laser Rangefinder* [#7170]  
Laurent Gatet, Helene Tap-Beteille and Marc Lescure  
Electronic Laboratory LEN7 - ENSEEIHT, France

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## **Special Session Th1d: Measurement Applications of Intelligent Data Processing II**

*Thursday, May 3, 8:30AM-10:00AM, Room: Ballroom D*  
*Chair: Annamaria R.Varkonyi-Koczy, Fabrizio Russo*

8:30AM *Calibration and Error Model Analysis of 3D Monocular Vision Model Based Hand Posture Estimation* [#7286]  
Ayman El-Sawah, Nicolas D. Georganas and Emil M. Petriu  
Univ. of Ottawa, Canada

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8:45AM *Improvement of the Segmentation by means of the Addition of a Color Vector and the Modeling of the Dispersions of Saturation and Hue* [#7441]  
Edward Blanco, Manuel Mazo, Luis Miguel Bergasa, Sira Palazuelos and Juan Carlos Garcia  
University of Alcala, Spain

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9:00AM *Gaussian Noise Estimation in Digital Images Using Nonlinear Sharpening and Genetic Optimization* [#7665]  
Fabrizio Russo  
University of Trieste - D.E.E.I., Italy

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9:15AM *Fuzzy Area-Based Image Scaling* [#7413]  
Angelos Amanatiadis, Ioannis Andreadis and Konstantinos Konstantinidis  
Democritus University of Thrace, Greece

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9:30AM *Gradient Based Synthesized Multiple Exposure Time HDR Image* [#7498]  
Andras Rovid, Annamaria R. Varkonyi-Koczy, Takeshi Hashimoto, Szilveszter Balogh and Yoshifumi Shimodaira  
Dept. . of Electrical and Electronics Engineerin, Japan; Dept. of Measurement and Information Systems, B, Hungary; Dept. of Electrical and Electronics Engineering, Japan

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## **Session Th1ef: Sensors & Transducers II**

*Thursday, May 3, 8:30AM-10:00AM, Room: Ballroom EF*  
*Chair: Wladyslaw Torbicz*

8:30AM *Development of a IEEE 1451 Standard Compliant Smart Transducer Network with Time Synchronization Protocol* [#7639]  
Helena Ramos, Pedro Ramos and Pavel Paces  
Instituto de Telecomunicacoes, DEEC, IST, Portugal; Czech Technical University in Prague, Faculty of, Czech Republic

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8:45AM *Piezoceramic Ultrasonic Transducer with Frequency Controlled Radiation Pattern* [#7210]  
Johannes Kellner and Herbert Schweinzer  
Vienna University of Technology, Austria

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9:00AM *Digital Differential Capacitive Angle Transducer* [#7637]  
Boby George and V. Jagadeesh Kumar  
Research Scholar, Dept. of EE, IIT Madras., India; Professor, Dept. of EE, IIT Madras., India

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9:15AM *2microWatt Three Axis Accelerometer for Chronic Orientation and Activity Sensing* [#7235]  
Timothy Denison, Kelly Consoer, Keith Miesel, Wesley Santa and Mike Hutt  
Medtronic, United States

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9:30AM *Local information from Range-Speed Radar sequences* [#7444]  
Philip P. van Dorp and Frans F.C.A. Groen  
TNO, Netherlands; University of Amsterdam, Nicaragua

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## **Session Th1ws: Dielectric & Magnetic Measurements**

*Thursday, May 3, 8:30AM-10:00AM, Room: Wawel-Syrena*

*Chair: Devendra Misra*

8:30AM *Improved Method for Measurement of the Dielectric Properties of Microwave Substrates Using Microstrip Resonator* [#7182]

Dusan Markovic, Branka Jokanovic, Milka Marjanovic and Miroslav Djordjevic  
Institute IMTEL, Serbia and Montenegro

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8:45AM *Dielectric and Magnetic Measurements on Ferrite Ceramics at Millimeter Waves* [#7346]

Konstantin Korolev, Shu Chen and Mohammed Afsar  
Tufts University, United States

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9:00AM *A High-Resolution Quasi Optical Spectrometer for Complex Permittivity and Loss Tangent Measurements at Millimeter Wavelengths* [#7443]

Shu Chen, Joshua Kupersmidt, Konstantin Korolev and Mohammed Afsar  
ECE Dept. of Tufts University, United States

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9:15AM *A TD-FD Combined Method for Enhancing Reflectometry Measurements in Liquid Quality Monitoring* [#7204]

Andrea Cataldo, Luca Catarinucci, Luciano Tarricone, Filippo Attivissimo and Amerigo Trotta  
University of Lecce, Italy; Politecnico of Bari, Italy

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9:30AM *A Simple Microwave Technique for Determination of Complex Permittivity and Thickness of High-Loss Planar Samples* [#7676]

Ugur Cem Hasar and Charles Roger Westgate  
Ataturk University, Turkey; State University of New York at Binghamton, United States

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## **Special Session Th2ab: Reliable Design and Test of System-on-Chip - Instrumentation and Measurement Perspectives II**

*Thursday, May 3, 10:30AM-12:00PM, Room: Ballroom AB*

*Chair: Sunil Das*

10:30AM *A novel FPGA architecture with built-in error correction* [#7177]

Mohammed Anwar, Parag Lala and James Parkerson  
University of Arkansas, United States; Texas A&M University at Texarkana, United States

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10:45AM *A Fault Location Method Integrating a Distributed Measurement System and Wavelet Analysis* [#7240]

Lorenzo Peretto, Renato Sasdelli, Elisa Scala and Roberto Tinarelli  
University of Bologna, Italy

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11:00AM *IC Handler Throughput Evaluation for Test Process Optimization* [#7653]

Sheau-Chyi Lee, Serge Demidenko and Kok-Hua Lee  
School of Engineering, Monash University, Malaysia; Inst of Info Sci and Tech, Massey University, New Zealand; Freescale Semiconductor, Malaysia

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11:15AM *Using a Square-Wave Signal for Fault Diagnosis of Analog Parts of Mixed-Signal Embedded Systems Controlled by Microcontrollers* [#7071]

Zbigniew Czaja  
Gdansk University of Technology, Faculty of ETI, Poland

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## **Special Session Th2c: WEB-based Educational Tools and Labs**

*Thursday, May 3, 10:30AM-12:00PM, Room: Ballroom C*

*Chair: Theodore Laopoulos*

10:30AM *SMPC: A Problem Based Approach to Enhance Student's Learning on Instrumentation and Measurements* [#7024]

Subhas Mukhopadhyay  
Massey University, New Zealand

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10:45AM *A Remote Electrical Engineering Laboratory based on Reconfigurable Hardware* [#7167]

Kostas Efstathiou and Dimitris Karadimas  
Faculty Dept. ECE, University of Patras, Greece; Ph.D. Student, ECE, University of Patras, Greece

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11:00AM *An alternative methodology for develop virtual instruments in virtual labs* [#7516]

Heriberto Hernandez and Josue Garcia  
Electronics and Informatics Department, Mexico

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11:15AM *Distance Learning in Digital Electronics: Laboratory Practice on FPGA* [#7519]

Giovanni Vito Persiano, Sergio Rapuano, Francesco Zoino, Antonietta Morganella and Giovanni Chiusolo  
University of Sannio, Italy

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11:30AM *A Novel Approach for Laboratory Activities in E-Learning Courses* [#7540]  
Denny Bonatti, Gaetano Pasini, Lorenzo Peretto, Elisa Pivello and Roberto Tinarelli  
Alma Mater Studiorum - Universita' di Bologna, Italy

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## **Special Session Th2d: Recent Developments in Microwave Measurements I**

*Thursday, May 3, 10:30AM-12:00PM, Room: Ballroom D*  
*Chair: Wendy van Moer, Yves Rolain*

10:30AM *An Embedded Controller for the LSNA with Pulsed Measurement Capabilities* [#7537]  
Jean-Pierre Teyssier and Fabien De Groote  
XLIM University of Limoges, France

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10:45AM *Validation of a crystal detector model for the calibration of the Large Signal Network Analyzer* [#7309]  
Liesbeth Gomme, Johan Schoukens, Yves Rolain and Wendy Van Moer  
Vrije Universiteit Brussel, Belgium

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11:00AM *Design of a pulse generator for wideband applications* [#7515]  
Andrea Mariscotti and Luis Vaccaro  
DIE - University of Genova, Italy

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11:15AM *Rice-Distributed Signal Plus Noise in RF Receivers: Extraction of the Signal Amplitude - Spectrum Analyzer Applications* [#7394]  
Carlo F. M. Carobbi, Marco Cati, Gaetano Iuculano and Luigi M. Millanta  
University of Florence, Italy; Esaote S.p.A., Italy

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11:30AM *System identification approach applied to drift estimation* [#7123]  
Frans Verbeyst, Rik Pintelon, Yves Rolain, Johan Schoukens and Tracy Clement  
NMDG Engineering - Vrije Universiteit Brussel, Belgium; Vrije Universiteit Brussel, Belgium; National Institute of Standards and Technology, United States

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## **Session Th2ef: A/D and D/A Converters I**

*Thursday, May 3, 10:30AM-12:00PM, Room: Ballroom EF*

*Chair: Pasquale Daponte*

*10:30AM Metrological Characterization of an Improved DSP-Based On-Line Integrator for Magnetic Measurements at CERN [#7221]*

Pasquale Arpaia, Vitaliano Inglese and Giovanni Spiezia

University of Sannio, Dpt. of engineering, Italy; CERN, AT/MTM, Geneva, Switzerland; University of Naples, FEDERICO II. CERN, AT/MTM, Italy

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*10:45AM Selecting the Optimal Resolution and Conversion Frequency for A/D and D/A Converters [#7548]*

Camilo Quintans Grana

University of Vigo, Spain

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*11:00AM Optimization of Delta-Sigma ADC for Column-Level Data Conversion in CMOS Image Sensors [#7597]*

Alireza Mahmoodi and Dileepan Joseph

University of Alberta, Canada

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*11:15AM Methods of Additional Improvement of Intelligent CADC Performance [#7641]*

Lukasz Malkiewicz and Anatoliy Platonov

Warsaw University of Technology, Poland

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*11:30AM A Contribution to Advanced Extraction Methods for Static ADC Non-linearity [#7448]*

Ondrej Subrt, Pravoslav Martinek and Carsten Wegener

ASICentrum, Czech Republic; Czech Technical University in Prague, Czech Republic; Infineon Technologies AG, Germany

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## **Session Th2ws: Mechanical Measurements & Material Analysis**

*Thursday, May 3, 10:30AM-12:00PM, Room: Wawel-Syrena*

*Chair: Boguslaw Jarosz*

*10:30AM Quantitative Nondestructive Evaluation of the Crack on the Austenite Stainless Steel Using the Induced Eddy Current and the Hall Sensor Array [#7085]*

Jonwoo Jun, Jiseong Hwang and Jinyi Lee

Chosun University, South Korea

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10:45AM *Experimental Validation of FEA Modelling of Touch Trigger Probes* [#7602]  
Mohd Rizal Salleh, Qing Ping Yang, Barry Jones and Peng Wei  
Brunel University, United Kingdom

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11:00AM *Moving Web Tension Determination by Out of Plane Vibrations Measurement Using a Laser* [#7084]  
Marc Vedrines, Dominique Knittel, Vincent Gassmann and Christophe Doignon  
INSA Strasbourg, France; University of Strasbourg, Web Handling Research, France

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11:15AM *Non-Contact Characterisation of Carbon-Fibre-Reinforced Plastics (CFRP) Using Multi-frequency Eddy Current Sensors* [#7288]  
Wuliang Yin, Philip Withers, Umesh Sharma and A J Peyton  
School of Electrical and Electronic Engineering, United Kingdom

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11:30AM *System Parameter Estimation for a Laser-Speckle Strain Gauge* [#7494]  
Roland Kothbauer, Stefan Rupitsch and Bernhard Zagar  
Institute for Measurement Technology (Linz), Austria

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## **Poster Session Th2p: Measurements of Physical Quantities**

*Thursday, May 3, 10:30AM-12:00PM, Room: Poster Hall*  
*Phasor Total Unbalance Power: Formulation and some properties* [#7371]  
Vicente Leon-Martinez, Joaquin Montanana-Romeu, Antonio Cazorla-Navarro, Jose Giner-Garcia and Jose Roger-Folch

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*On the Accuracy of Electric Energy Revenue Meter Chain Under Non-Sinusoidal Conditions: A Modeling Based Approach* [#7476]  
Daniele Gallo, Carmine Landi, Roberto Langella and Alfredo Testa  
SUN, Italy

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*A Circular Convolution based Algorithm for Electric Energy Measurement Under Non-Sinusoidal Conditions* [#7619]  
Roberto Langella and Alfredo Testa  
SUN, Italy

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*ZnO Surge Arresters Diagnosis Using Microcontroller* [#7270]  
Jose Lira, Euler Macedo, Edson Costa, Benedito Luciano and Raimundo Freire  
Campina Grande Federal University, Brazil

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*Considering the uncertainty on the network parameters in the optimal planning of measurement systems for Distribution State Estimation* [#7630]

Carlo Muscas, Fabrizio Pilo, Giuditta Pisano and Sara Sulis  
DIEE, University of Cagliari, Italy

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*Measurement Equipment for On-Site Calibration of Energy Meters* [#7317]

Antonio Delle Femine, Daniele Gallo, Carmine Landi and Mario Luiso  
Seconda Universita' di Napoli, Italy

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*Determination of Digital Voltmeter Input Parameters* [#7655]

Ivan Lenicek, Damir Ilic and Roman Malaric  
Faculty of Electrical Engineering and Computing, Croatia

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*Flicker Measurement System for Wind Turbine Certification* [#7130]

Jose Julio Gutierrez, Jesus Ruiz, Luis Alberto Leturiondo and Andoni Lazkano  
Dpt. Electronics and Telecommunications, UPV, Spain

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*Analysis of the Mutual Inductance of a Precise Rogowski Coil* [#7685]

Luka Ferkovic, Damir Ilic and Roman Malaric  
Faculty of Electrical Eng. and Computing, Zagreb, Croatia

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*High voltage multi-purpose current and voltage electronic transformer* [#7460]

Pierino Bertolotto, Marco Faifer and Roberto Ottoboni  
Passoni and Villa, Italy; Dip. Elettrotecnica-Politecnico di Milano, Italy

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*An application of an LMS algorithm for polyharmonic power calibrator* [#7432]

Janusz Kaczmarek  
University of Zielona Gora, Poland

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*National PQ Monitoring Network for Turkish Electricity Transmission System* [#7629]

Turan Demirci, Alper Kalaycioglu, Ozgul Salor, Serkan Pakhuylu, Mehmet Dagli, Tugberk Kara, Hasan S. Aksuyek, Cigdem Topcu, Beyhan Polat, Semih Bilgen, Umut Sezen, Isik Cadirci and Muammer Ermis  
TUBITAK UZAY, Turkey; METU Dept. of EE, Turkey; Hacettepe University Dept. of EE, Turkey; TUBITAK UZAY, Hacettepe University Dept. of EE, Turkey

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*Estimation of the Utility's and Consumer's Contribution to Harmonic Distortion* [#7052]  
Gilvan de Andrade, S. R. Naidu, Max Neri and Edson da Costa  
Universidade Federal de Campina Grande, Brazil

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*Instantaneous Sequence-Components Resolution of 3-Phase Variables and Its Application to Dynamic Voltage Restoration* [#7079]  
D. A. Fernandes, S. R. Naidu and C. A. E. Coura Jr  
UFCG, Brazil

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*Power system properties periodical time variance investigations: hardware and software tools development* [#7666]  
Staroszczyk Zbigniew  
Warsaw University of Technology, Poland

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*Mobile Monitoring System to Take PQ Snapshots of Turkish Electricity Transmission System* [#7624]  
Ercument Ozdemirci, Yener Akkaya, Burak Boyrazoglu, Serkan Buhan, Alper Terciyanli, O. Unsar, E. Altintas, B. Haliloglu, A. Acik, T. Atalik, O. Salor, T. Demirci, I. Cadirci and M. Ermis  
Turkish Electricity Transmission Co., Turkey; TUBITAK-Uzay, Turkey

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*Methods for Ripple Index evaluation in DC Low Voltage Distribution Networks* [#7159]  
Andrea Mariscotti  
DIE - University of Genova, Italy

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*A 2D model for an EIT sensor and image reconstruction algorithms using two-port measurement strategy* [#7041]  
Zhang Cao, Huaxiang Wang, Xiaolei Shi and Yong Yan  
Tianjin University, China; University of Kent, United Kingdom

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*Shielding Effectiveness Measurements for Ferromagnetic Shields* [#7262]  
Mirko Marracci, Bernardo Tellini and Carmine Zappacosta  
University of Pisa, Italy

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*Fabrication of RF Magnetic Shielding Plate Having the Polarization Characteristics* [#7268]  
Tokoh Nishikubo, Hiro Norikane, Hiroki Endo, Keisuke Itoh, Fumio Tojo and Mineo Itoh  
Graduate School of Kinki University, Japan; Kitagawa Industrial Co. Ltd., Japan; Grad. School of Kinki Univ., Yamabun Electronics, Japan

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*Radial position detection of magnetic islands and electron cyclotron power deposition in the FTU Tokamak* [#7620]

Gabriele D'Antona, Sante Cirant, Franco Gandini, Enzo Lazzaro, Jacopo Berrino and Francesco Iannone  
Politecnico di Milano, Italy; Istituto di Fisica del Plasma, Italy; Istituto di Fisica del Plasma, Switzerland;  
FTU-ENEA, Italy

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*Autocalibration of Dew Point Hygrometer Based on Integrated Semiconductor Detector* [#7109]

Daniel Paczesny, Grzegorz Tarapata, Jerzy Weremczuk and Ryszard S. Jachowicz  
Warsaw University of Technology, Poland

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*Design and Development of a sensor prototype for Soil Moisture Measurement: First Experimental Results* [#7541]

Francesco Adamo, Gregorio Andria, Filippo Attivissimo, Laura Fabbiano and Nicola Giaquinto  
Politecnico di Bari - DEE, Italy

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*Dew/Frost Point Recognition with Fingerprint Sensor* [#7103]

Jerzy Weremczuk  
Warsaw University of Technology, Poland

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*On line measurement of the mold distribution temperatures during the casting cycle time* [#7340]

Antoni Garcia, Jordi Cusido, Luis Romeral, Juan Antonio Ortega and Javier Rosero  
MCIA , UPC Research Group, Spain

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*Water Content Estimation in Granular Materials by Time Domain Reflectometry: a Key-note on Agro-Food Applications* [#7209]

Andrea Cataldo, Mariangela Vallone and Luciano Tarricone  
University of Lecce, Italy

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*Thickness Measurement of Metallic Plates with an Electromagnetic Sensor Using Phase Signature Analysis* [#7290]

Wuliang Yin and A.J. Peyton  
University of Manchester,, United Kingdom

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*Application of Double Current Bridge-Circuit for Simultaneous Measurements of Strain and Temperature* [#7451]

Adam Idzkowski, Jaroslaw Makal and Zygmunt Warsza  
Bialystok Technical University, Poland; Polish Metrological Society, Poland

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*Measurement of Permeability and Ferrite/austenite Phase Fraction Using a Multi-frequency Electromagnetic Sensor* [#7289]

Wuliang Yin, Xingjiang Hao, A. J. Peyton, M. Strangwood and Claire Davis

University of Manchester,, United Kingdom; Birmingham University, United Kingdom

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*Vibration Detector based on GMR Sensors* [#7306]

Jose Pelegri, Jorge Alberola, Rafa Lajara and Jesus Santiso

Polytechnic University of Valencia, Spain

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*Characterization of a Novel and Widely-Tunable Yb:KYF4 Laser for Optical Frequency Metrology* [#7196]

Gianluca Galzerano, Paolo Laporta, Elisa Sani, Giovanni Bonelli, Alessandra Toncelli, M. Tonelli, Michele Norgia, Alessandro Pesatori and Cesare Svelto

Istituto di Fotonica e Nanotecnologie - CNR, Dip, Italy; National Enterprise for Nano Science and Technol, Italy

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*Photocurrent and electroluminescence mapping system for optoelectronic device characterization using a PC sound card for data acquisition* [#7102]

Heinz-Christoph Neitzert and Nicola Rainone

Salerno University, Italy

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*Temperature and distance-dependent errors in a dual-cavity fibre Fabry-Perot interferometer for vibration analysis* [#7232]

Saroj Pullteap, Han Cheng Seat and Thierry Bosch

Laboratoire d'Electronique, ENSEIHT - INPT, France

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*Optical fiber turbidimeter for full range measurement in wine industrial processes* [#7599]

Miguel A. Perez, Antonio Garcia and Jesus A. Baro

University of Oviedo, Spain; University of Valladolid, Spain

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*Novel Measurement System Data Handling for the Extraction of Weak Signals in Optical Vibrometry* [#7224]

Michele Norgia and Cesare Svelto

Politecnico di Milano, Italy

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*Designing and making a scintillometer. Atmospheric measures and signal processing* [#7527]

Pierre-Adrien Solignac, Jean-Louis Selves, Jean-Pierre Beteille and Jean Philippe Gastellu-Etchegorry

CESBIO/GRITE, France

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*Photonic liquid crystal fiber as a sensing element for electric field measurement* [#7662]  
Tomasz Wolinski, Slawomir Ertman, Aleksandra Czapla, Andrzej Domanski, Jan Wojcik, Roman Dabrowski and Edward Nowinowski-Kruszelnicki  
Warsaw University of Technology, Poland; Maria Curie Skłodowska University, Poland; Military University of Technology, Poland

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*Novel bandwidth measurement method for partially coherent light sources* [#7670]  
Daniel Budaszewski, Andrzej Domanski and Tomasz Wolinski  
Faculty of Physics, Warsaw University of Technol, Poland

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*Next-Generation Digital High-Bandwidth Spectroscopy Sensor Systems* [#7356]  
Mark Yeary, Redmond Kelley, John Meier, Andy Snyder, Ann Arul, T. Hicks, P. McCann, C. Roller, and D. Guidry  
University of Oklahoma, United States

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*Numerical Simulations of Fluidic Flowmeter with Large Measurement Range* [#7189]  
Dailiang Xie, Ting Fang, Guona Li and Guowei Liang  
China Jiliang University, China; PetroChina Tarim Oilfield Company, China

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*Plastic Optical Fiber Sensor for Real Time Density Measurements in Wine Fermentation* [#7534]  
Ana Maria Cao y Paz, Jorge Marcos Acevedo, Jesus Doval Gandoy, Alfredo Del Rio Vazquez, Carlos Martinez Penalver Freire and María Luisa Soria  
University of Vigo, Spain

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*Distributed Network for Accurate Indoor Localization of Mobile Phones* [#7692]  
Domenico Alessandro Lampasi and Luca Podesta'  
University of Rome "La Sapienza", Italy

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*Microwave Dielectric Properties Measurements Using the Waveguide Reflection Dielectric Resonator* [#7250]  
Jyh Sheen  
National Formosa University, Taiwan

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*High Resolution Dispersive Fourier Transform Spectroscopy for Pollutant Gases at Millimeter Wave and Terahertz Frequencies* [#7479]  
Nawaf Almoayed and Mohammed Afsar  
Tufts University, Medford, MA, United States

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*Pattern Recognition of Vis/NIR Spectroscopy from White Vinegar Based on PLS and BP-ANN Model* [#7279]

Li Wang, Yong He and Fei Liu  
Zhejiang University, China

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*Bending Curve Modeling of Ionic Polymer Metal Composites in Soft Actuator Applications* [#7353]

B. G. L. T Samaranayake, D.M.G. Preethichandra, A.M.U.S.K. Alahakoon and Keiichi Kaneto  
University of Peradeniya, Sri Lanka; Kyushu Institute of Technology, Japan, Japan; University of Peradeniya, Sri Lanka, Sri Lanka

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*Measurement Augmentation to Compensate for Sensor Registration Using a Neural Kalman Filter* [#7136]

Stephen Stubberud, Kathleen Kramer and J. Antonio Geremia  
Rockwell Collins, United States; University of San Diego, United States; Entropic Communications, United States

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*Instrumentation for onsite measurements on power transformers* [#7486]

Palani Anniyappan, Venkataraman Jayashankar, Jagadeesh Kumar, Panchapagesan Sankaran and Heinz A Maier  
IIT Madras, India; University of Stuttgart, Germany

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### **Special Session Th3ab: Reliable Design and Test of System-on-Chip - Instrumentation and Measurement Perspectives III**

*Thursday, May 3, 2:00PM-3:30PM, Room: Ballroom AB*

*Chair: Serge Demidenko*

*2:00PM Further Studies on Zero-Aliasing Space Compression Based on Graph Theory* [#7283]

Altaf Hossain, Sunil R. Das, Amiya R. Nayak, Emil M. Petriu, Satyendra Biswas and Mehmet Sahinoglu  
University of Ottawa, Canada; University of Ottawa (and Troy University), Canada; Georgia Southern University, United States

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*2:15PM Pseudo-Exhaustive Built-in Self-Testing of Signal Integrity for High-Speed SoC Interconnects* [#7355]

Jianxun Liu, Wen-Ben Jone and Sunil Das  
U. of Cincinnati, United States; U. of Ottawa, Canada

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2:30PM *Space Compaction for Embedded Cores-Based System-on- Chips (SOCs) Using Fault Graded Output Merger* [#7381]

Sujoy Mukherjee, Sunil R Das, Emil M. Petriu, Mansour H Assaf and Altaf Hossain  
University of Ottawa, Canada; University of Ottawa (and Troy University), Canada; University of Ottawa, Cape Verde; University of Trinidad and Tobago, Trinidad

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2:45PM *Testing Based SOC/VLSI IP Identification and Protection Platform* [#7216]

Yu-Cheng Fan, Arvin Chiang, Da-Cheng Sung, Tsung-Chen Chi, Jiyin-Chang Jiang, Yin-Te Hsieh and Jan-Hung Shen  
National Taipei University of Technology, Taiwan; National Taiwan University, Taiwan

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3:00PM *A High Spurious-Free Dynamic Range 4-bit ADC with Nyquist Signal Bandwidth for Wideband Communication* [#7608]

Henry Chen and Mingzhen Wang  
Wright State University, United States

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### **Special Session Th3c: Distributed Measurements Systems for Educational Labs**

*Thursday, May 3, 2:00PM-3:30PM, Room: Ballroom C*

*Chair: Domenico Grimaldi*

2:00PM *Considerations when Designing and Using Virtual Instruments as Building Blocks in Flexible Measurement System Solutions* [#7137]

David Wisell, Patrik Stenvard, Anders Hansebacke and Niclas Keskitalo  
Ericsson AB, Royal Institute of Technology, Sweden; Ericsson AB, Sweden; Ericsson AB, University of Gavle, Sweden

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2:15PM *An Object-Oriented Approach for Developing Distributed Measurement Laboratory Using Microsoft .NET Technology* [#7149]

Jian-Wei Lin, Yuan-Cheng Lai, Andrew Lin, Hsin-Hsu Peng and Yu-Chin Szu  
National Taiwan University of Science and Techno, Taiwan; Electronics Testing Center, Taoyuan, Taiwan, Taiwan

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2:30PM *A Framework for Low Data Rate, Highly Distributed Measurement Systems* [#7325]

Goran Horak, Darko Vasic and Vedran Bilas  
University of Zagreb, Croatia

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2:45PM *A Smart Distributed Measurement Data Management System for DSM* [#7331]

Alberto Amato, Vincenzo Di Lecce and Vincenzo Piuri  
DIASS - Politecnico di Bari - V.le del Turismo 8, Italy; DTI - University of Milan - Via Bramante 65, 260, Italy

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3:00PM *Reconfigurable Platform to implement Electronic Instrumentation* [#7544]  
Camilo Quintans and Enrique Mandado  
University of Vigo, Spain

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### **Special Session Th3d: Recent Developments in Microwave Measurements II**

*Thursday, May 3, 2:00PM-3:30PM, Room: Ballroom D*  
*Chair: Wendy van Moer, Yves Rolain*

2:00PM *Non Linear RF device characterization in time domain using an active loadpull Large Signal Network Analyzer* [#7264]  
Damien Ducatteau, Matthieu Werquin, Bertand Grimbert, Erwan Morvan, Didier Theron and C. Gaquiere  
IEMN-CNRS, France; MC2-technologies, France; Alcatel-Thales III-V Lab, France

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2:15PM *Measuring the Response of a Voltage Controlled Oscillator using the Large-Signal Network Analyser* [#7118]  
Yves Rolain, Wendy Van Moer, Rik Pintelon and Johan Schoukens  
Vrije Universiteit Brussel, Belgium

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2:30PM *Measurement and Modeling of the Sensitivity of LC-VCO's to Substrate Noise Perturbations* [#7242]  
Stephane Bronckers, Gerd Vandersteen, Charlotte Soens, Geert Van der Plas and Yves Rolain  
IMEC/VUB, Belgium; IMEC, Belgium; VUB, Belgium

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2:45PM *Measuring Dynamic Nonlinearity in High-Speed Digital Scopes* [#7590]  
Attilio Di Nisio, Filippo Attivissimo and Nicola Giaquinto  
Polytechnic of Bari, Italy

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3:00PM *Enhanced Time Base Jitter Compensation of Sine Waves* [#7097]  
Frans Verbeyst, Yves Rolain, Johan Schoukens and Rik Pintelon  
NMDG Engineering - Vrije Universiteit Brussel, Belgium; Vrije Universiteit Brussel, Belgium

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## **Session Th3ef: A/D and D/A Converters II**

*Thursday, May 3, 2:00PM-3:30PM, Room: Ballroom EF*

*Chair: Istvan Kollar*

*2:00PM Identification of a one-bit lowpass sigma-delta modulator using BIMBO [#7115]*

Eric Colinet and Jerome Juillard

CEA/LETI/DCIS/SCME/LMEA, France; SUPELEC/SSE, France

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*2:15PM Timing Error Calibration in Time-Interleaved ADC by Sampling Clock Phase Adjustment [#7368]*

Zheng Liu, Kazutaka Honda, Masanori Furuta and Shoji Kawahito

Shizuoka University, Japan

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*2:30PM Susceptibility of dual-slope ADCs to electromagnetic interference: An experimental analysis [#7397]*

Marcos Quilez, Oscar Casas and Ramon Pallas-Areny

Technical University of Catalonia (UPC), Spain

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*2:45PM Static Calibration of High Resolution DAC Based on Over Sampling and Low Resolution ADC [#7446]*

Domenico Carni and Domenico Grimaldi

University of Calabria, Italy

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*3:00PM Influence of test signal phase noise on high-resolution ADC testing [#7483]*

Vladimir Haasz, Milan Komarek, Jaroslav Roztocil, David Slepicka and Petr Suchanek

Czech Technical University in Prague, Czech Republic

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## **Session Th3ws: Distributed Measurement Systems**

*Thursday, May 3, 2:00PM-3:30PM, Room: Wawel-Syrena*

*Chair: Wiesław Winiecki*

*2:00PM Wireless Distributed Measurement System Based on PDA and Dynamical Application Repository Server [#7611]*

Andrea Aiello, Domenico Luca Carni, Domenico Grimaldi, Giuseppe Guglielmelli and Francesco

Lamonaca

University of Calabria, Italy

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2:15PM *Synchronization of Measurement Instruments Co-operating into the W-DMS* [#7632]  
Domenico Carni, Domenico Grimaldi, Giuseppe Guglielmelli and Francesco Lamonaca  
University of Calabria, Italy

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2:30PM *Smart Transducer Web Services Based on the Proposed IEEE 1451.0 Standard* [#7575]  
Kang Lee and Eugene Song  
National Institute of Standards and Technology, United States

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2:45PM *An Adaptive-Rate Time Synchronization Protocol for Wireless Sensor Networks* [#7576]  
David Macii and Dario Petri  
DIT - University of Trento, Italy

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### **Special Session Th4ab: Space - Frontiers of Measurement**

*Thursday, May 3, 4:00PM-5:30PM, Room: Ballroom AB*  
*Chairs: Brian Wadell, John Schmalzel, Reza Zoughi*

4:00PM *Virtual Instrument for a Micro-satellite Power Supply System* [#7358]  
Kay Soon Low and Chao Zheng  
Nanyang Technological University, Singapore

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4:15PM *High Resolution Millimeter Wave Inspecting of the Orbiter Acreage Heat Tiles of the Space Shuttle* [#7694]  
Joseph T Case, Sergey Kharkovsky, Reza Zoughi and Frank Hepburn  
University of Missouri-Rolla, United States; NASA MSFC, United States

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4:30PM *Panel Discussion: Extending the Frontiers of Space Measurement*

### **Session Th4c: Methodology of Teaching I&M**

*Thursday, May 3, 4:00PM-5:30PM, Room: Ballroom C*  
*Chair: Richard Thorn*

4:00PM *Modular Workbench For In-Situ and Remote Laboratories* [#7612]  
Benjamin Sanchez and Ramon Bragos  
Technical University of Catalonia (UPC), Spain

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4:15PM *Remote Didactic Laboratory in Electronic Measurements: Quality of System Testing* [#7635]  
Pasquale Daponte, Sergio Rapuano, Mariella Riccio and Francesco Zoino  
Department of Engineering, University of Sannio, Italy; Didagroup S.p.A., Italy

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4:30PM *Virtual Experiments in Nuclear Physics* [#7329]  
Wieslaw Tlaczala and Marcin Zaremba  
Warsaw University of Technology, Poland

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4:45PM *A/D Converters Learning Using Software Tools* [#7615]  
Camilo Quintans Grana and Manuel Alonso Castro Gil  
University of Vigo, Spain; Spanish University for Distance Education, Spain

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### **Special Session Th4d: Recent Developments in Microwave Measurements III**

*Thursday, May 3, 4:00PM-5:30PM, Room: Ballroom D*  
*Chairs: Wendy van Moer, Yves Rolain*

4:00PM *A Fully-Automated Measurement System for 77-GHz Mixers* [#7465]  
Christoph Wagner, Markus Tremel, Marcus Hartmann, Andreas Stelzer and Herbert Jaeger  
CD Lab for Integrated Radar Sensors, Austria; University of Erlangen, Germany; Danube Integrated Circuit Engineering, Austria

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4:15PM *Extending the Best Linear Approximation for Frequency Translating Systems: The Best Mixer Approximation* [#7412]  
Koen Vandermot, Wendy Van Moer, Yves Rolain and Rik Pintelon  
Vrije Universiteit Brussel - ELEC, Belgium

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4:30PM *A Multisine Based Calibration for Broadband Measurements* [#7018]  
Wendy Van Moer and Yves Rolain  
Vrije Universiteit Brussel, Belgium

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4:45PM *Implementation Considerations on the Use of Zhu's General Sampling Theorem for Characterization of Power Amplifiers* [#7203]  
David Wisell and Peter Handel  
Ericsson AB, Sweden; Royal Institute of Technology, Sweden

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## **Session Th4ef: A/D and D/A Converters III**

*Thursday, May 3, 4:00PM-5:30PM, Room: Ballroom EF*

*Chair: Antonio da Cruz Serra*

4:00PM *Post-correction of Under-sampled Analog to Digital Converters* [#7032]

Niclas Bjorsell and Peter Handel

University of Gavle, ITB/Electronics, Sweden; Royal Institute of Technology, Signal Processing, Sweden

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4:15PM *Reduction of the Conversion Time of the Non-Uniform Differential Tracking A/D Converter* [#7471]

Dusan Agrez

University of Ljubljana, Slovenia

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4:30PM *A/D Converter INL and DNL Estimation with a Distorted Sinusoidal Stimulus Signal* [#7022]

Bei Wang, Jian Qiu Zhang and Yong Wang

Dept. of E. E., Fudan University, China

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4:45PM *ADC Testing with Verification* [#7644]

Balazs Fodor and Istvan Kollar

Budapest University of Technology and Economics, Hungary

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5:00PM *Improved Static Testing of A/D Converters for DC Measurements* [#7439]

Attilio Di Nisio, Giuseppe Cavone, Nicola Giaquinto, Laura Fabbiano and Mario Savino

Polytechnic of Bari, Italy

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## **Session Th4ws: Distributed Measurement Systems II**

*Thursday, May 3, 4:00PM-5:30PM, Room: Wawel-Syrena*

*Chair: Kang Lee*

4:00PM *Simulation of Distributed Measurement-Control Systems* [#7522]

Emil Michta and Adam Markowski

University of Zielona Gora, Poland

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4:15PM *A Peer-to-Peer Distributed System for Multipoint Measurement Techniques* [#7475]

Fabrizio Ciancetta, Edoardo Fiorucci, Biagio D'Apice and Carmine Landi

University of L'Aquila, Italy; Second University of Naples, Italy

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4:30PM *Underwater Acoustic Source Localization based on Passive Sonar and Intelligent Processing* [#7675]

Octavian Postolache, Pedro Girao and Jose Miguel Dias Pereira

Instituto de Telecomunicacoes, Polo de Lisboa, Portugal;

Institute of Telecommunications, IMG, Lisbon, Portugal; LabIM/EST - IPS Setubal, Portugal

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4:45PM *Dependable k-coverage algorithms for sensor networks* [#7373]

Gyula Simon, Miklos Molnar, Laszlo Gonczy and Bernard Cousin

University of Pannonia, Veszprem, Hungary; IRISA, Rennes, France; Budapest Univ. of Technology and Economics, Hungary

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5:00PM *Conducted Disturbance Measurement System Based on a GRID Architecture* [#7600]

Vincenzo Cacciatore, Simone Corbellini, Marco Parvis and Alberto Vallan

Politecnico di Torino, Italy

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## **Poster Session Th4p: Measurement Applications**

*Thursday, May 3, 4:00PM-5:30PM, Room: Poster Hall*

*Control System Modeling for Superconducting Accelerator* [#7492]

Tomasz Czarski, Krzysztof Pozniak and Ryszard Romaniuk

Warsaw University of Technology, Poland

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*Pneumatic Cylinder Diagnostics using Classification Methods* [#7689]

Zilvinas Nakutis and Paulius Kaskonas

Lithuania

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*Autonomous Dead-Reckoning Mobile Robot Navigation System With Intelligent Precision Calibration* [#7594]

Md. Suruz Miah, Wail Gueaieb, Md. Abdur Rahman and Abdulmotaleb El Saddik

University of Ottawa, Canada

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*Electro-Optic Velocity Measurement of Water Jet Cutting Plants* [#7512]

Massimiliano Annoni, Loredana Cristaldi, Michele Norgia and Cesare Svelto

Dip. Meccanica, Politecnico di Milano, Italy; Dip. Elettrotecnica, Politecnico di Milano, Italy; Dip. Elettronica e Inf., Politecnico di Milano, Italy

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*Velocity and pressure measurements for microturbine control in NMR application* [#7563]  
Salvatore D'Arco, Ferdinanda Ponci, David Doty and John Staab  
University of South Carolina, United States; Doty Scientific Inc, United States

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*Accurate Speed Measurement Methodologies for Formula One Cars* [#7420]  
Luigi Cocco and Sergio Rapuano  
University of Sannio, Italy

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*ESTATS: Embedded Systems Timing Analysis Tool Suite Prototype* [#7550]  
Richard Scottow, Andrew Hopkins and Klaus McDonald-Maier  
University of Essex, United Kingdom

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*Fields Tests for Ranging and Localization with Time-of-Flight- Measurements Using Chirp Spread Spectrum RF-devices* [#7292]  
Axel Sikora and Voicu Groza  
University of Cooperative Education Loerrach, Germany; University of Ottawa, Canada

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*A Wireless Location System for Sensing the Relative Position between Mining Vehicles* [#7374]  
Pavel Khrebtov, Alois Poettker, Stephan Max and Martin Vossiek  
Clausthal University of Technology, Germany; Terex GmbH, Germany; Clausthal University of Technology, Symeo GmbH, Germany

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*A distributed Measurement System for the Evaluation of the Safety State in Highway Tunnels* [#7623]  
Claudio De Capua, Bruno Piccolo and Emilia Romeo  
DIMET, University Mediterranea of Reggio Calabria, Italy DIMET, University Mediterranea of Reggio Calabria, Italy DIMET, University Mediterranea of Reggio Calabria, Italy Dimet, University Mediterranea of Reggio Calabria, Italy

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*Electro-Hydraulic Actuator Tester for Fly-By-Wire Aircrafts* [#7585]  
Samuel E. de Lucena and Edson Y. Suzuki  
Sao Paulo State University, Brazil; EMBRAER, Brazil

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*Calibration and modelling of a bottom sea geophone based on Virtual Instrument* [#7490]  
Xavier Roset, Antoni Manuel-Lazaro, Shahram Shariat-Panahi and Joaquin Del Rio  
SARTI-UPC Technical University of Catalonia, Spain; SARTI-UPC. Technical University of Catalonia, Spain

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*New temperature factor of power quality, especially for marine technology applications* [#7421]  
Piotr Gnacinski, Janusz Mindykowski and Tomasz Tarasiuk  
Gdynia Maritime University, Poland

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*Experimental verification of new concept of power quality temperature factor* [#7422]  
Piotr Gnacinski, Janusz Mindykowski and Tomasz Tarasiuk  
Gdynia Maritime University, Poland

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*Air Pollution Control. Measurement of Ground Level Ozone with the Photometric Method. Uncertainty Analysis of the Sampling Phase* [#7312]  
Gregorio Andria, MariaPaola Sassi, Alfonso Campo, Artur Ribeiro Lopez and AnnaMaria Lanzolla  
Politecnico di Bari, Italy; Istituto Nazionale di Ricerca Metrologica INRIM, Italy; Instituto Superior Tecnico, Portugal

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*Wind Speed Measurement Data Fusion of Phase Difference and Time-of-Flight Techniques Using Ultrasonic Transducers* [#7607]  
Juan Villanueva, Sebastian Catunda, Ricardo Tanscheit and Mauro Pinto  
PUC-Rio, UFMA, Brazil; UFMA, Brazil; PUC-Rio, Brazil

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*Some aspects of design and measurements results prediction for a Mobile Observation Point for a hydrocarbon pollution monitoring system* [#7230]  
Bogdan Dziadak and Andrzej Michalski  
Warsaw University of Technology, Poland

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*A New Method Based on Biophotonic Instrumentation for Environmental Monitoring* [#7543]  
Antonio Boscolo, Alessandro Cont and Barbara Piuze  
University of Trieste, Italy; AllTeK Innovation S.r.l., Italy

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*Magnetic Field Measurement in Industrial Environment* [#7447]  
Matteo Bertocco, Cristiano Greggio, Elisabetta Sieni and Alessandro Sona  
Padova University, Italy

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*A Smart and Portable Solution for Heavy Metals Concentration Measurements* [#7690]  
Jose Pereira, Octavian Postolache and Pedro Girao  
ESTSetubal-LabIM/IPS, Portugal; Instituto de Telecomunicacoes, Portugal

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*A Patient-Adaptive ECG Measurement System for Fault-Tolerant Diagnoses of Heart Abnormalities* [#7606]

Claudio De Capua, Antonino Battaglia, Antonella Meduri and Rosario Morello  
DIMET-University Mediterranea of Reggio Calabria, Italy

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*A system for simultaneous signals acquisition of EMG activity, bite force, and muscle pain, reveals the rotation of synergistic activity in the human jaw elevator muscles* [#7504]

Arrigo Palumbo, Mauro Farella, Sara Avecone, Calogero Pace and Giuseppe Cocorullo  
DEIS, Univ. of Calabria, Italy; DOCG, Univ. of Naples "Federico II", Italy

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*Comparative Analysis of tactile sensibility between the fingers in vibrotactile stimulus recognition* [#7266]

Ana Lima, Raimundo Freire, Rodrigo Silva, Francisco Assis and Anderson Souza  
FUCAPI, Brazil; UFCG, Brazil; UFAM, Brazil

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*A digital signal processing approach for modulation quality assessment of WiMAX systems* [#7621]

Leopoldo Angrisani, Massimo D'Apuzzo and Mauro D'Arco  
Universita di Napoli Federico II, Italy

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*Experimental Performance Analysis Of Power Line Telecommunication Modem For Indoor Applications* [#7477]

Giovanni Betta, Domenico Capriglione, Luigi Ferrigno and Marco Laracca  
DAEIMI, University of Cassino, Italy

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*Assessing coexistence problems of IEEE 802.11b and IEEE 802.15.4 wireless networks through cross-layer measurements* [#7326]

Leopoldo Angrisani, Matteo Bertocco, Daniele Fortin and Alessandro Sona  
University of Naples Federico II, Italy; University of Padova, Italy

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*A Dual Logarithm Model for Estimation of WCDMA Downlink Pole Capacity in Multipath Propagation Channel and Verification with Measurements in Live Node B Sites* [#7431]

Yi-Hua Chen, Y.C. Wang and C. L. Lai  
Communication Engineering Department of Oriental, Taiwan

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*A Study of Measurement-Based Traffic Models for Network Diagnostics* [#7257]

Giada Giorgi and Claudio Narduzzi  
Univ. di Padova - Dept. Information Engineering, Italy

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*Performance assessment and optimization of DVB-T systems affected by in-channel interference* [#7241]  
Leopoldo Angrisani, Mario Farias, Daniele Fortin and Alessandro Sona  
University of Naples Federico II, Italy; Digilab - Bozen, Italy; University of Padova, Italy

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