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Welcome Message from the General Co-Chairs

Haere Mai

On behalf of the IEEE International Instrumentation and Measurement Technology Conference (I2MTC) Organizing Committee, the I2MTC Board of Directors, and the IEEE Instrumentation and Measurement Society, we warmly welcome you to I2MTC 2019 in Auckland, New Zealand.

Auckland is the 'financial capital' and the largest city of New Zealand. One-third of the nation's population lives here. It is a vibrant global city with top class educational and research establishments, advanced industries, modern architectures, as well as diverse mix of cultures, landscapes and tastes. Nestled between two harbours, Auckland is an amazing place of bays, beaches, islands, and vineyards. Auckland boasts strong Polynesian traditions and is alive with cultural and ethnic diversity. We hope that I2MTC 2019 attendees will enjoy the conference, the city of Auckland, and Aoteroa New Zealand – "Land of the Long White Clouds"!

The 2019 IEEE I2MTC theme that we have selected is "**The Lords of the IMS: Expanding the Frontiers of Metrology Innovations**". It is not a sheer coincidence that Monday, May 20, 2019 is also the World Metrology Day, commemorating the anniversary of the signing of the Meter Convention in 1875! Papers will be presented in 5 parallel tracks and poster sessions. New horizons are explored through the topics selected for the main tracks complemented by special sessions, tutorials and plenary talks. Apart from the traditional fields of measurement and instrumentation, such as measurement theory, data acquisition and metrology, which will be discussed, there are tracks on hot topics such as agriculture and forestry, environment, energy and power. Over 400 delegates are going to attend the event making it the largest ever conference in Australasia in the fields of instrumentation and measurement.

We are very lucky to have three eminent scientists who have graciously agreed to deliver keynote addresses during the conference. We would like to extend our sincere thanks and gratitude to all the keynote speakers for sparing their valuable time to address the delegates. Dr. Alan Finkel, Chief Scientist of Australia will deliver a talk on *The Measure of an Incurable Engineer*, Dr. Michael de Podesta from the NPL Temperature and Humidity Group, UK, will talk about *Redefining the Kilogram, the Kelvin, the Ampere and the Mole: Why You Should Care Even Though You Won't Notice*, and Prof. Cather Simpson from the University of Auckland's Physics and Chemistry Department will deliver her presentation on the topic of *Photonics Transforming 21st Century Sensing*. We would also like to extend our sincere thanks to Prof. Juliet Gerrard, Chief Science Advisor to the Prime Minister of New Zealand, who has so kindly agreed to grace the opening ceremony as the chief guest of honour.

Some years ago we started the tradition of organizing free tutorials on the first day of the conference. Over the years, these tutorials have become very popular with the attendees, especially students. This year is no exception: almost 200 delegates have registered to attend the tutorials. Our Tutorial Co-Chairs, Prof. Octavia Dobre and Prof. Eric Matson, have worked very hard to line up a very interesting program of tutorial sessions which will be presented by eminent scientists and practitioners. Three of these tutorials will be delivered by industry specialists.

The Special Sessions Co-Chairs, Prof. Adam Osseiran, Dr. Ian Platt, and Prof. Kurt Barbé have coordinated the process of soliciting special session proposals and evaluating them through a rigorous process. Traditionally, the special sessions allow in-depth discussions on niche topics. There are nine special sessions in the conference program on topics ranging from NDT&E of structural health to power quality measurement and biological instrumentation. It is very heartening to note that the Technical Committees (TC) of the Instrumentation and Measurement Society have played a very active role in proposing and organizing several of the special sessions.

The theme for the World Metrology Day 2019 is The *International System of Units - Fundamentally Better*. In keeping with this theme, the Measurement Standards Laboratory (MSL) of New Zealand has organised a mini symposium on *SI for the 21st Century*. There will be four presentations in this symposium including one by Dr. Lindsey Mackay of the National Measurement Institute, Australia. We would like to thank Dr. Farzana Masouleh and her colleagues at MSL for organizing the symposium. Special thanks to MSL also for sponsoring the keynote speaker.

On Wednesday evening, the whole IEEE I2MTC 2019 group will move to the Auckland War Memorial Museum for cocktails and a gala dinner. The venue is one of New Zealand's most important museums and war memorials. Its collections concentrate on New Zealand state, natural, and military history. Maori welcome and cultural performance awaits the delegates.

We are delighted to have so many sponsors and exhibitors. We would like to say a big thank you and express deep gratitude to our silver patrons - the Auckland Bioengineering Institute, National Instruments, and RF Test Solutions & ADLINK; our keynote patron - the Measurement Standards Laboratory (MSL); and the exhibitors - Massey University, Chosun University, and VICOM. Support from the sponsors and exhibitors was of key importance to organise this conference successfully. We extend our gratitude and thanks are also going to the Tourism New Zealand (TNZ) and Auckland Tourism, Events and Economic Development (ATEED) bureau for their immense support during the various stages of the conference preparation.

Many people have worked tirelessly to make this 2019 edition of the IEEE Instrumentation and Measurement Society's flagship conference a grand success and an enjoyable event. Our Technical Program Co-Chairs, Prof. Vincenzo Piuri, Prof. Andrew Taberner, and Prof. Melanie Ooi have done a stellar job of putting together a very strong technical program. We would like to thank them from the core of our hearts. Their job was one of the hardest and most challenging. In total, over 430 papers were received. Each paper had to be allocated to reviewers, the received review reports analysed, decisions made, and then the final fine-tuned program put together. Immense thanks also to all the reviewers who have spent valuable time to evaluate the papers and submit their reports in a timely manner. Thanks also go out to Prof. Bruno Ando, our Publications Chair. This conference would not have been possible if the authors had not submitted papers so we would like to thank all of them for choosing I2MTC and for their participation in the conference. Last, but not the least, our sincere special thanks to all the Conference Catalyst staff, especially Ms Laura LeBlanc and Ms Judy Scharmann, for managing the conference so efficiently, paying attention to every minute detail.

We hope you all will enjoy the conference and have a stimulating time while sharing and discussing your research as well as socialising with colleagues.

Ngā mihi

Gourab Sen Gupta and Serge Demidenko,
General Co-Chairs

I²MTC 2019 Organizing Committee

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Serge Demidenko, *Sunway University, Malaysia & Massey University, New Zealand*

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Vincenzo Piuri, *University of Milan, Italy*

Andrew Taberner, *University of Auckland, New Zealand*

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Eric Matson, *Purdue University, USA*

Special Sessions Co-Chairs:

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Ian Platt, *Lincoln AgriTecch, New Zealand*

Kurt Barbe, *Vrije Universiteit Brussel, Belgium*

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Micro and Nanotechnology in Instrumentation and Measurement
Salvatore Graziani
Aime Lay-Ekuakille

Measurement Theory and Metrology
Marco Parvis

Advances in Modern Instrumentation
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Amitava Chatterjee
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Antonio Moschitta

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Ruqiang Yan

Virtual Measurement Systems and Soft Sensors
Yuri Catunda

Non-Invasive Measurement Methods and Systems
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Measurement for Food Safety
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Measurement in Industrial Applications and Industry 4.0
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Measurement for Energy and Power
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A big thank you to the FMTC 2019 Reviewers!

I²MTC 2019 Plenary Speakers



Dr. Alan Finkel
Chief Scientist
Australia

The Measure of an Incurable Engineer

ABSTRACT:

As an early career researcher, Alan Finkel discovered three things. First, that for him, perfecting the instruments was far more interesting than doing the experiments. Second, that the work of many scientists could be dramatically accelerated by an instrumentation breakthrough achieved by even a single engineer. And third, that the key to personal success was to be that engineer, and study the leading-edge laboratory tools intently – because they hold the seeds of the truly disruptive technologies to come.

Dr. Finkel reflects on his journey from post-doc, through industry, to his current position as Australia's Chief Scientist; and shares the lessons learned along the way for engineers with the taste for measurement instrumentation.

SPEAKER BIO:

Dr. Finkel commenced as Australia's Chief Scientist on 25 January 2016. He is Australia's eighth Chief Scientist. Prior to becoming Chief Scientist, he was the eighth Chancellor of Monash University and the eighth President of the Australian Academy of Technology and Engineering (ATSE).

Since commencing as Chief Scientist, Dr. Finkel has led a number of national reviews, delivering the 2016 National Research Infrastructure Roadmap, the 2017 Review into the National Electricity Market ("Finkel Review") and the 2018 STEM Industry Partnership Forum report. He serves as the Deputy Chair of Innovation and Science Australia.

Dr. Finkel has an extensive science background as an entrepreneur, engineer, neuroscientist and educator. He was awarded his PhD in electrical engineering from Monash University and worked as a postdoctoral research fellow in neuroscience at the Australian National University.

In 1983 he founded Axon Instruments, a California-based, ASX-listed company that made precision scientific instruments. After Axon was sold in 2004, Dr. Finkel became a director of the acquiring company.

In 2006, he focused his career in Australia and undertook a wide range of activities including co-founding Cosmos Magazine. During his time at ATSE, he led the development and implementation of the STELR program for secondary school science.

I²MTC 2019 Plenary Speakers



Dr. Michael de Podesta
NPL Temperature and Humidity Group

Redefining the Kilogram, the Kelvin, the Ampere and the Mole: Why You Should Care Even Though You Won't Notice

ABSTRACT:

Progress in science and engineering is often linked to progress in metrology. If we cannot measure something then we cannot begin to understand it (science) or improve it (engineering). And better measurement leads to better understanding and control. Measurement is the quantitative comparison of an unknown quantity with a standard. In the International System of Units – the ‘SI’ – there are seven standard quantities called the ‘base units’: the second, metre, kilogram, ampere, kelvin, candela and mole. The perfection with which these definitions can be made real, represents a fundamental limit to achievable measurement uncertainty. In order to remove these limits, from May 2019 there will be subtle but profound changes in the definitions of four of these base units – the kilogram, ampere, kelvin and mole. In this talk Michael de Podesta will explain the rationale for the forthcoming changes and why, even though you are unlikely to personally or professionally notice any changes, you should be happy about them.

SPEAKER BIO:

Michael de Podesta is a physicist specialising in temperature metrology in the NPL Temperature and Humidity Group. He led the research team that produced an estimate of the Boltzmann constant with the second lowest uncertainty ever and published the most accurate temperature measurements in history. He is interested in all aspects of metrology and communicates with the public through talks and demonstration lectures. He writes a blog at <http://protonsforbreakfast.org>

Michael graduated with a BSc from Sussex University in 1981 and then in 1985 completed a DPhil in the electronic properties of metals at cryogenic temperatures. After postdoctoral work at Bristol University, he was appointed a lecturer at the University of London in 1987, and joined NPL in 2000.

I²MTC 2019 Plenary Speakers



Prof. Cather Simpson

Professor
University of Auckland's Physics and Chemistry
Departments

Photonics Transforming 21st Century Sensing

ABSTRACT:

The 21st century is already seeing the rising impact of photonics – the creation, manipulation, control and use of light. No where is the rise of high-performance coupled with cost-effectiveness being felt than in optical sensing. I will discuss how photonic technologies are transforming optical sensing, and highlight with examples from my research team in the Photon Factory at the University of Auckland. There, we are exploiting today's light-based sensing for applications that range from sorting of sperm by sex and "point of cow" diagnostics for the dairy industry to evaluating the nutritional health of mussel beds, improving prostate cancer diagnostics and monitoring stress with wearable sensors.

SPEAKER BIO:

Professor Cather Simpson joined the University of Auckland's Physics and Chemistry departments in 2007. She received her Ph.D. in the USA in Medical Sciences with a focus on the ultrafast vibrational dynamics of heme proteins. After completing a Department of Energy Distinguished Postdoctoral Fellowship, she joined the Chemistry Department at Case Western Reserve University as an Assistant Professor to pursue research in ultrafast energy conversion in molecules. After earning tenure and promotion at CWRU, she moved to the University of Auckland, where her research now spans fundamental spectroscopy to applied device development.

Cather's research focuses on the interaction of light with matter, particularly how materials can convert light into more useful forms of energy. Cather is a Principal Investigator in the MacDiarmid Institute and the Dodd-Walls Centre and was Chair of the New Zealand National Committee for the UNESCO 2015 International Year of Light. She has received a long stretching list of science, teaching and entrepreneurial excellence awards. She is the founding Chief Science Officer of Engender Technologies and Orbis Diagnostics, both international award-winning spin-offs from the Photon Factory at the University of Auckland.

I²MTC 2019 Invited Presentations

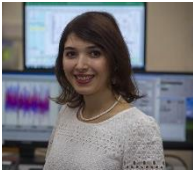


Prof. Reza Zoughi

Schlumberger Distinguished Professor, Electrical & Computer Engineering Department & Applied Microwave Nondestructive Testing Laboratory (AMNTL), Missouri University of Science & Technology (S&T)

A Comprehensive Insight into Effective and Informed Archival Journal Publication Process

Mini-symposium on SI for the 21st Century



Organizer: Farzana Masouleh

Light and Temperature Team at MSL



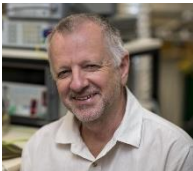
Dr. Lindsey Mackay
National Measurement Institute, Australia

The Avogadro Constant and the Mole Presenter



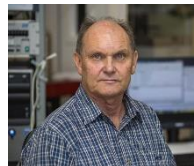
Dr. Yin Hsien Fung
Research Scientist, Mass & Related Quantities Section of MSL

The Planck Constant and the Kilogram



Dr. Murray Early
Principle Research Scientist, MSL

The Elementary Charge and the Ampere



Dr. Rod White
Distinguished Scientist, Temperature and Light Section of MSL

The Boltzmann Constant and the Kelvin

The IEEE International Contest of Sensors and Measurement Systems

Date: Wednesday, May 22nd from 13:00 – 15:00

Room: Aucklander

This international competition addresses teams of PhD, Master students and advanced undergraduates (particularly those in fast-track, dual BS/MS, Master programs) and aims to stimulate innovative ideas for applications in the area of sensors and measurement systems.

The IEEE International Contest of Sensors and Measurement Systems is jointly promoted and organized by IEEE Instrumentation and Measurement Society (IMS) and IEEE Sensors Council (SC) and is sponsored by STMicroelectronics who will provide the SensorTile® kit (www.st.com/sensortile) that will be the common technology platform of the contest.

Those willing to participate will have to submit a proposal, will have to develop their application at their University laboratories and attend one of the scheduled live demonstration sessions co-located with international conferences in the areas of sensors and instrumentation and measurement. For each demonstration event, two awards will be assigned (1st and 2nd place) for the best “Sensors and Measurement Systems” application.

The IEEE IS&M-SC participants will have to autonomously secure funding for travel and living expenses to attend the demo session. Students participating in the live demonstration session of the IEEE IS&M-SC will receive a free one-day pass for the conference while for those interested in attending the whole conference, student registration rate applies.

Team 1: KIWI “Keen Italian Weather Investigator”

Leila Es Sebar, Politecnico di Torino, Italy

Alessio Gullino, Politecnico di Torino, Italy

Leonardo Iannucci, Politecnico di Torino, Italy

Luca Lombardo, Politecnico di Torino, Italy

Team 2: Smart tracker and gesture capturer for people with Parkinson’s diseases

José Iltón de Oliveira Filho, King Abdullah University of Science and Technology (KAUST), Saudi Arabia

I²MTC 2019 Conference Sponsors



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I²MTC 2019 Silver Patrons



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Auckland Bioengineering Institute

Auckland Bioengineering Institute is a world-leading research institute at the University of Auckland, that aims to improve medical diagnosis and treatment of injury and disease. We do this through the application of engineering sciences and technical innovation to medicine and human physiology.

RF Test Solutions & ADLINK



RF Test Solutions Ltd based in Lower Hutt, is New Zealand's largest electronic test and measurement instrumentation sales and services company providing high technology specialist electronic equipment and services to education, research, government and commercial business. We represents a number of world leading electronic measurement companies in New Zealand including ADLink, leading developers of edge computing and industrial embedded/distributed acquisition solutions and platforms. At I²MTC 2019 ADLink and RF Test Solutions will showcase a range of measurement, sensing, acquisition and data processing devices and platforms transforming the way information can be collected, analysed and distributed for a more intelligent future.

National Instruments

National Instruments (NI) accelerates productivity, innovation, and discovery through an open, software-defined platform which has helped Engineers and Scientist to develop and increase the performance of automated test and automated measurement systems. For more than 40 years, NI has developed high-performance automated test and automated measurement systems to help solve engineering challenges now and into the future. NI is equally dedicated to supporting academia in teaching and research. Researchers are driving time-critical, ambitious innovation while addressing grand engineering challenges in the broad areas of transportation, wireless communications, medicine, energy and climate change. Across each of these application areas, researchers need to easily acquire measurements, scale to complex multidisciplinary systems, and rapidly prototype a scalable solution. NI is central to accelerating researcher innovation by providing the technology and support to prototype systems, publish findings and secure funding.



i²MTC 2019 Keynote Patrons



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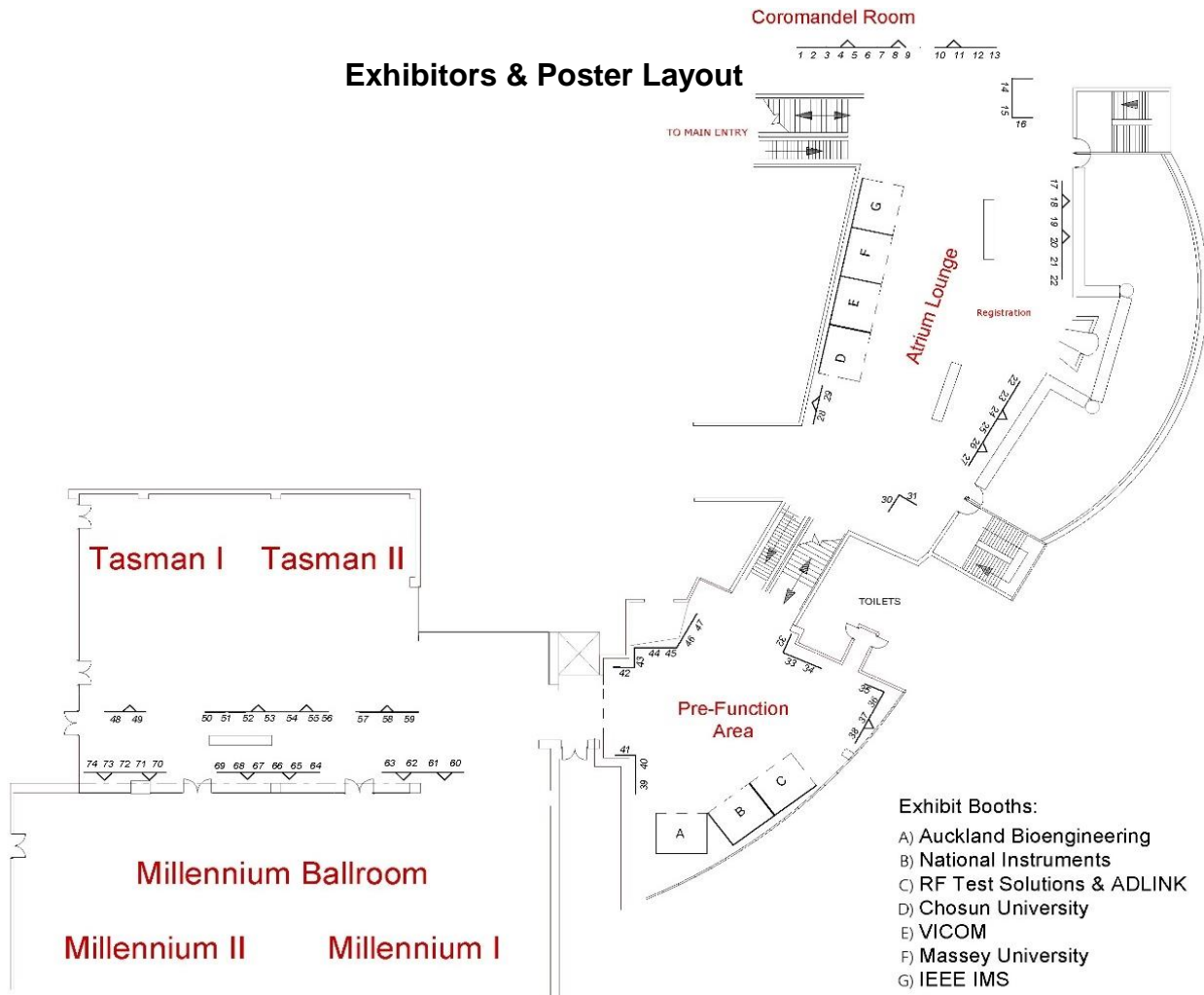
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Exhibitors & Poster Layout



- Exhibit Booths:**
- A) Auckland Bioengineering
 - B) National Instruments
 - C) RF Test Solutions & ADLINK
 - D) Chosun University
 - E) VICOM
 - F) Massey University
 - G) IEEE IMS

I²MTC Tradition

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

- 1984 – Long Beach, CA, USA, Automation-Quality-Productivity
- 1985 – Tampa, FL, USA, Measurement Science
- 1986 – Boulder, CO, USA, Standards of Excellence
- 1987 – Boston, MA, USA, The Changing Face of I&M Technologies
- 1988 – San Diego, CA, USA, Intelligence in Instrumentation
- 1989 – Washington, DC, USA, Persuasive I&M Technology – A Resource
- 1990 – San Jose, CA, USA, Emerging Measurement Technologies
- 1991 – Atlanta, GA, USA, Enhancing Productivity with Instrumentation and Measurement Technologies
- 1992 – Meadowlands, NJ, USA, Smart People, Smart Instruments, Smart Measurements
- 1993 – Irvine, CA, USA, Innovative Ideas for Industry
- 1994 – Hamamatsu, Japan, Advanced Technologies in Instrumentation and Measurement
- 1995 – Waltham, MA, USA, I3C – Integrating Intelligent Instrumentation and Control
- 1996 – Brussels, Belgium, Quality Measurements – The Indispensable Bridge between Theory and Reality (No Measurements? No Science!)
- 1997 – Ottawa, Canada, Sensing, Processing, Networking
- 1998 – St. Paul, MN, USA, Where Instrumentation is Going
- 1999 – Venice, Italy, Measurements for the New Millennium
- 2000 – Baltimore, MD USA, Smart Connectivity: Integrating Measurement and Control
- 2001 – Budapest, Hungary, Rediscovering Measurement in the Age of Informatics
- 2002 – Anchorage, AK, USA, The Frontier of Instrumentation and Measurement
- 2003 – Vail, CO, USA, Instrumentation and Measurement at the Summit
- 2004 – Lake Como, Italy, From the Electrometer to the Networked Instruments: A Giant Step toward a Deeper Knowledge
- 2005 – Ottawa, Canada, The 22nd Reunion
- 2006 – Sorrento, Italy, A View on the New Technologies for Instrumentation and Measurement
- 2007 – Warsaw, Poland, Synergy of Science and Technology in Instrumentation and Measurement
- 2008 – Victoria, British Columbia, Canada, Advances in the Science of Measurement Technology
- 2009 – Singapore, Always On: Instrumentation and Measurement in the Networked World
- 2010 – Austin, TX, USA, Innovative and Integrated Applications of I&M
- 2011 – Binjiang, Hangzhou, China, Instrumentation and Measurement for Improving Quality of Life
- 2012 – Graz, Austria, Smart Measurements for a Sustainable Environment
- 2013 – Minneapolis, MN, USA, Instrumentation and Measurement for Life
- 2014 – Montevideo, Uruguay, Instrumentation and Measurement for Sustainable Development
- 2015 – Pisa, Italy, The "Measurable" of Tomorrow: Providing a Better Perspective on Complex Systems
- 2016 – Taipei, Taiwan, Measuring the Pulse of Industries, Nature and Humans
- 2017 – Torino, Italy, "Man is the measure of all things" - Protagoras
- 2018 – Houston, TX, USA, Discovering New Horizons in Instrumentation and Measurement
- 2019 – Auckland, New Zealand, The Lords of the IMS: Expanding the Frontiers of Metrology Innovations

Awards and Distinctions

Each year the IEEE Instrumentation and Measurement Society accepts nominations for its awards. The AdCom Awards Committee manages the nominations process, reviews the candidates, and recommends a slate. The slate of candidates is then submitted to the Society AdCom for approval and the awards are presented at our annual Awards Ceremony held as part of the I2MTC conference. The Awards Committee is pleased to announce the 2018-2019 winners.

2018 Transactions Outstanding Associate Editors

Mohamed Abou-Khousa, *Khalifa University of Science and Technology, UAE*
Christoph Baer, *Ruhr-Universität Bochum, Germany*
Salvatore Baglio, *University of Catania, Italy*
Kurt Barbé, *Vrije Universiteit Brussel, Belgium*
Vedran Bilas, *University of Calabria, Croatia*
Amitava Chatterjee, *Jadavpur University, India*
Roberto Ferrero, *University of Liverpool, United Kingdom*
Edoardo Fiorucci, *Università degli Studi dell'Aquila, Italy*
Domenico Grimaldi, *Univesita Della Calabria, Italy*
Huang-Chen Lee, *National Chung-Cheng University, Taiwan*
Anirban Mukherjee, *Indian Institute of Technology Kharagpur, India*
Dario Petri, *Università degli Studi di Trento, Italy*
Wendy Van Moer, *University of Gävle, Sweden*
Emanuele Zappa, *Politecnico di Milano, Italy*

IEEE Instrumentation and Measurement Society Andy Chi Best Paper Award

The I&M Society Andy Chi Best Paper Award is awarded to recognize an author or authors of the outstanding paper published in the IEEE Transactions on Instrumentation and Measurement two years ago.

The 2018 Andy Chi Best Paper Award is given for the paper: *A Spinning Current Circuit for Hall Measurements Down to the NanoTesla Range.*

The recipients are:

Vincent Mosser, *Issy Technology Center, Issy-les-Moulineaux, France*
Nicolas Matringe, *Issy Technology Center, Issy-les-Moulineaux, France*
Youcef Haddab, *Issy Technology Center, Issy-les-Moulineaux, France*

IEEE Instrumentation and Measurement Society Best Application Award

The I&M Society Best Application Award recognizes an individual whose idea applies measurement concepts or instrumentation technology in a novel way to benefit society. The application must be a working solution to an engineering need or problem.

The 2018 Best Application Award recipient is:



Robert X. Gao
Case Western Reserve University, USA

"A Multivariate Sensor for In-Situ Process Monitoring of Injection Molding"

Robert Gao is the Cady Staley Professor of Engineering and Department Chair of Mechanical and Aerospace Engineering at Case Western Reserve University in Cleveland, Ohio, USA. He was the Pratt & Whitney Chair Professor at the University of Connecticut during 2008-2015. Since receiving his Ph.D. degree from the Technical University of Berlin, Germany in 1991, he has been working on physics-based sensing methods, design, modeling, and characterization of instrument systems, and stochastic modeling and machine learning techniques. The goal of his research is to improve the observability of dynamical systems such as manufacturing equipment and processes so as to better understand the underlying physical mechanisms, to ultimately improve process and product quality control.

Prof. Gao is a Fellow of the IEEE, ASME (American Society of Mechanical Engineers), SME (Society for Manufacturing Engineers), and CIRP (International Academy for Production Engineering). He is an elected member of the Connecticut Academy of Science and Engineering. He was a Distinguished Lecturer of the IEEE Instrumentation and Measurement Society and the Electron Devices Society, respectively. He was the lead guest editor for the Special Issue on Data Science-Enhanced Manufacturing of the ASME Journal of Manufacturing Science and Engineering, and served as Associate Editor for journals of the IEEE, ASME, and IFAC. He has supervised approximately 40 PhD and MS students to their graduation, published three books and over 370 refereed technical papers, including over 150 journal articles, and holds 12 patents. He is a recipient of multiple honors and awards, including the Eli Whitney Productivity Award from SME, Blackall Machine Tool and Gage Award from ASME, Hideo Hanafusa Outstanding Investigator Award from ISFA (International Symposium for Flexible Automation), Technical Award from the IEEE Instrumentation and Measurement Society, multiple Best Paper Awards, Outstanding Faculty Awards, and an NSF Early CAREER award.

IEEE Instrumentation and Measurement Society Outstanding Young Engineer Award

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

The 2018 Outstanding Young Engineer Award recipient is:



José de Jesús Rangel-Magdaleno
INAOE, Mexico

“For outstanding contributions in the development of FPGA-based digital systems and digital signal processing techniques for industrial and scientific applications in the field of electric rotating machinery.”

Jose de Jesus Rangel-Magdaleno (S'08–M'13–SM'17) received the B.E. degree in electronics engineering and the M.E. degree in electrical engineering on hardware signal processing from Universidad de Guanajuato, Mexico in 2006 and 2008, respectively. He received the Ph.D. degree from the Universidad Autonoma de Queretaro, Mexico in 2011. He is currently Full Researcher at the Electronics Department at INAOE, Mexico. He has authored 1 book, and more than 75 works published in book chapters, journals and conferences. He is a member of the Mexican national research system (SNI), level 1. His research interests include FPGAs, signal and image processing, instrumentation and mechatronics.

IEEE Instrumentation and Measurement Society Technical Award

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

The 2018 Technical Award recipient is:



Tuan Guo

Institute of Photonics Technology, China

"For outstanding contributions to the Advancement of Energy and Health monitoring technologies."

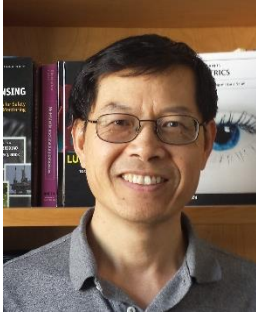
Tuan Guo is a Professor in the Institute of Photonics Technology, Jinan University, China. He received the Ph.D. in Optics from Nankai University in 2007. His research activities include optical fiber sensing, fiber gratings, plasmonics, sensors and instrumentation for life science, environmental and renewable energy applications. He has authored and coauthored more than 200 papers in peer-reviewed journals and conferences, including Nature Communications, Light: Science & Applications, 6 tutorial/invited reviews and 1 Handbook Chapter in Springer Nature. He presented over 30 invited talks at international conferences and holds 19 issued/pending patents. He was awarded the "Distinguished Young Award" by National Natural Science Foundation of China.

Dr. Guo is a Senior Member of IEEE and a Senior Member of Optical Society of America. He is working as the Co-Chair of the IEEE I&M Technical Committee "Photonic Technology in Instrumentation and Measurement" and is Guest Editing a special issue of IEEE Journal of Lightwave Technology on behalf of the IEEE I&M society. He served as the Associate TPC Chair of IEEE International Instrumentation and Measurement Technology Conference 2019 (Auckland, New Zealand), TPC Section Chair of CLEO Pacific Rim Conference 2018 (Hong Kong, China), Session Chair of IEEE International Instrumentation and Measurement Technology Conference 2018 (Houston, USA), Session Chair of IEEE International Flexible Electronics Technology Conference 2018 (Ottawa, Canada), the International Steering Technical Committee of the OFSIS 2017 (Brisbane, Australia), and over 10 Technical Program Committee / Session Chairs for several years.

IEEE 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 2018 Distinguished Service Award recipient is:



George Xiao
National Research Council, Canada

“For outstanding and valuable services to many aspects of the IEEE Instrumentation and Measurement Society”

Dr. Gaozhi (George) Xiao is an IEEE fellow, IEEE-IMS member and a senior research officer of the National Research Council Canada.

Dr. Xiao received his Ph.D. from Loughborough University, UK in 1995. He has managed large R & D projects in industries, academics and government labs covering areas including RFID/NFC, flexible/printable/wearable electronics, fiber optic sensor systems, photonic sensing and measurement, structural health monitoring, indoor air quality monitoring, structural materials, smart materials, etc. Dr. Xiao has transferred several technologies to industries and he has directly contributed to the creation of hundreds of high tech jobs in Canada. Dr. Xiao has published more than 100 papers in refereed journals and refereed conference proceedings, and 1 co-edited book. He is currently holding 4 US patents. Dr. Xiao is a recipient of multiple awards, including the Technical Award from the IEEE Instrumentation and Measurement Society (2014), Outstanding Associate Editor Award from the IEEE Transactions on Instrumentation and Measurement (2011, 2012, 2013 and 2018), and several prestige awards from his current and former employers.

IEEE Instrumentation and Measurement Society Career Excellence Award

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

The 2018 Career Excellence Award recipient is:



Kang B. Lee

National Institute of Standards and Technology

"For serving the profession technically through his research on Clock Synchronization and leading standardization efforts to disseminate the knowledge; and for serving the I&M Society through organizing and co-chairing conferences and through his work on TC-9."

Kang B. Lee received his B.S.E.E. degree from the Johns Hopkins University and M.S.E.E. degree from the University of Maryland. Kang is an IEEE Life Fellow and retiree of the National Institute of Standards and Technology (NIST) with over forty years of technical and managerial experiences in precision instrumentation and measurements, flexible and robotic manufacturing, smart and wireless sensor/actuator networks, and precision time synchronization of networked measurement and control systems. Kang is currently a research associate at NIST working on the development of guidelines for implementing reliable and high-performance wireless systems used in industrial automation. In addition, he is also working on smart sensor models, measurements, and standards for smart grids. Throughout his tenure at I&M, Kang has initiated some conferences and standards projects by engaging participants from industry, academia, and government to work with and join I&M. In 2001 Kang initiated a conference called, Sensors for Industry Conference (Slcon). This was a unique conference addressing state-of-the-art sensors development and applications. Through his connection, Kang engaged the International Society for Automation (ISA) with I&M to jointly establish this conference. Slcon provided a means of establishing greater contacts among practitioners, engineers, and scientists in the field of sensor technology. After Kang nurtured Slcon for a few years, this conference has turned into I&M's own IEEE Sensors Applications Symposium, which has been in business for 15 years. Kang is also the chairman of I&M Society's Technical Committee TC-9 on Sensor Technology overseeing the development of a family of thirteen IEEE 1451 smart transducer interface standards for wired and wireless sensor networks, some of which have co-sponsorships from Industry Electronics Society and Sensors Council. TC-9 also oversees the development of the IEEE 1588 standard, which is recognized worldwide as the Precision Time Protocol (PTP) standard. PTP has been adopted for use across industries, such as industrial automation, telecommunication, smart grids, financial transactions, sub-nanosecond timing operations at CERN, and more. Kang also worked with the international standards organization to adopt IEEE 1451.X as ISO/IEC 21451.X and IEEE 1588 as IEC 61588 standards. Profiles of IEEE 1588 have been established for other IEEE and IEC relevant standards. During the development of the IEEE 1588 standard, Kang initiated Precision Time Synchronization workshops and a conference at NIST by engaging industry, academia, and government to focus on implementation and demonstration of technologies based on the IEEE 1588 standard. After five years, Kang turned this conference into today's IEEE International Symposium on Precision Clock Synchronization for Measurement, Control, and Communication (ISPCS), since 2007. ISPCS is a key I&M symposium that engages industry participants. The unique way of engaging industry in ISPCS is through the symposium's Plugfest event, adopted from earlier workshops at NIST. At the Plugfests, manufacturers bring their prototype equipment and software to test with those from other manufacturers for interoperability before they sell their products to consumers. This is a good way to

ensure plug-and-play of products and systems from different manufacturers. In addition to numerous publications in IEEE journals and conferences, Kang has given invited keynotes about smart sensors, sensors and radio frequency identification (RFID), Internet of Things (IoT), and precision time protocol (PTP) in various conferences worldwide.

Kang has received numerous awards, including Industry Research Magazine Best 100 Products Award (IR100), Department of Commerce (DoC) Bronze Award, IEEE Third Millennium Medal, IEEE Instrumentation and Measurement Society Distinguish Service Award, DoC/NIST William P. Slichter Award, NIST Edward Bennett Rosa Award, NIST Equal Employment Opportunity / Diversity Award, etc.

In 2018 Kang coauthored a NIST Advance Manufacturing Series 300-4, "Guides to Wireless Systems Deployments" for manufacturers to effectively and efficiently implement their wireless systems. In 2014 Kang co-chaired an IEC study group and workshop at NIST and its output turned into an IEC white paper, "Internet of Things: Wireless Sensor Networks", distributed worldwide. In 2006 the Electronic Engineering Times (EET) magazine's Great Minds and Great Ideas Project Recognition profiled Kang as one of twenty-nine innovators in the world.

IEEE Instrumentation and Measurement Society

J. Barry Oakes Advancement Award

The IEEE J. Barry Oakes Advancement Award will be used to provide a question and answer lecture during the annual I2MTC or AUTOTESTCON. Qualifications include one or more of the following: Demonstrated contributions to IMS science and engineering; potential leadership/project management skills; potential to serve as role model for other engineers.

The 2018 J. Barry Oakes Advancement Award recipient is:



Ali Foudazi

EMC Design Engineer, Apple Inc.

"For contributions to the advancement of Active Microwave Thermography as a nondestructive testing and evaluation technique."

Ali Foudazi (M'17, S'10) was born in Tehran, Iran, in 1986. He received the B.S.E.E. (2009) and M.S.E.E. (2012) from Shahed University, Iran. During 2013-2017, he was pursuing his Ph.D. at the Applied Microwave Nondestructive Testing Laboratory (amntl) at the Missouri University of Science and Technology (Missouri S&T) in the USA. In August 2017, he started a new position as an EMC Design Engineer at Apple Inc., in CA, USA.

Dr. Foudazi is a member of the IEEE IMS and Eta Kappa Nu. He has authored over 50 journal papers, conference proceedings and presentations, and technical reports in the areas of Nondestructive Testing and Evaluation, Antenna Design, Material Characterization, Metamaterials, and Electromagnetic Compatibility. His awards and honors include the 2017 IEEE Transactions on Instrumentation and Measurement Outstanding Reviewer, the 2017 Missouri S&T Dean's Ph.D. Scholar Award, the 2016 IEEE EMC Best Student Hardware Design Contest, the 2015 IEEE IMS Graduate Fellowship, and the 2015 ASNT Graduate Fellowship. He was a Session Co-Chair during the 25th - 27th ASNT Research Symposium. He has reviewed more than 150 journal and conference papers for the IEEE Journals including IEEE TIM, IEEE IMS Magazine, etc.

IEEE Instrumentation and Measurement Society Outstanding Technical Committee Award

This award is given annually to the best technical committee of the Instrumentation & Measurement Society.

To be announced.

IEEE Instrumentation and Measurement Society Graduate Fellowship Award

To be announced.

IEEE Instrumentation and Measurement Society Faculty Course Development Award

To be announced.

2019 Instrumentation and Measurement Society Fellows



Leopoldo Angrisani
Universita' di Napoli Federico II

"For contributions to test and measurement of communication systems."



Friedhelm Caspers
CERN

"For contributions to charged particle accelerators"

2018 Instrumentation and Measurement Society Senior Member Elevations

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Jesus Urena, *University of Alcalá, Spain*
Helko E. van den Brom, *VSL Dutch Metrology Insitute, Delft, The Netherlands*
He Wen, *Hunan University, China*
George Xiao, *National Research Council, Canada*
Yong Yan, *University of Kent, UK*
Wuqiang Yang, *University of Manchester, UK*
Emanuele Zappa, *Politecnico di Milano, Italy*
Reza Zoughi, *Missouri University of Science & Technology, USA*

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Education:

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Society Representatives, Directed Delegates and Liaisons:

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Finance:

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Society Management:

Salvatore Baglio, *University of Catania, Italy*

Publications:

Mark Yeary, *University of Oklahoma, USA*

Technical Committees and Standards:

Ruqiang Yan, *Southeast University, China*

Social Events

TUTORIAL/YOUNG PROFESSIONALS RECEPTION

Time: Monday, May 20th 18:00 – 20:00

Location: Pre-Function Area/Annexe

The Tutorial/Young Professionals Reception for I2MTC 2019 will take place on Monday, May 20 in the Grand Millennium Hotel. All attendees that are registered for the full conference are welcome to attend the tutorials and the reception.

WELCOME RECEPTION

Time: Tuesday, May 21st 17:30 – 19:30

Location: Pre-Function Area/Annexe

The Welcome Reception for I2MTC 2019 will take place on Tuesday, May 21 in the Grand Millennium Hotel. All attendees that are registered for the full conference are welcome to attend the tutorial and the reception.

GALA DINNER

Time: Wednesday, May 22nd 17:30 – 22:30

Location: Auckland War Memorial Museum

The conference Gala Dinner will take place on Wednesday, May 22 at the Auckland War Memorial Museum, a museum dedicated to New Zealand's history. On arrival, attendees will be welcomed in the Grand Foyer, enjoy a drink and browse the museum exhibits before moving to the Event Centre for an elegant dinner, accompanied by an authentic Māori cultural performance. The Museum tells the story of New Zealand, its place in the Pacific and its people. It has pre-eminent Māori and Pacific collections, significant natural history resources and major social and military history collections, as well as decorative arts and pictorial collections. All full conference registrations include one ticket to the Gala Dinner. Additional tickets for guests will be available for purchase during the registration process.



General Information

Registration & Information Desk

The Registration & Information desk is located in the Atrium Lounge.

Registration Hours:

Monday, May 20	8:00 – 17:30
Tuesday, May 21	7:00 – 19:00
Wednesday, May 22	7:30 – 16:30
Thursday, May 23	7:00 – 17:00

Meeting Room Locations:

Ground floor: Aucklander

Grand Ballroom level: Millennium Ballroom, Millennium 1, Millennium 2, Tasman 1, Tasman 2, Coromandel

Level 10: Tui 1, Tui 2

Poster Sessions, Exhibits, Coffee Breaks, and Lunches will take place in Atrium, Pre-Function Area and Annexe.

Name Badges are required for access to all conference events.

Electronic Proceedings

The conference proceedings will be available via a download option during the week of the conference.

Message Board

The Message Board will be located near the conference registration desk.

Conference Attire

Attire during the duration of the conference is business casual.

Coffee Breaks

Coffee and light snacks are available each morning and afternoon to registered attendees. Conference breaks are located in the Atrium, Pre-Function Area and Annexe.

Lunches

Lunch is provided each day to registered conference attendees. Tickets are provided in attendee badges. Attendees are required to remit a valid lunch ticket for entrance.

WiFi

WiFi Access is available to attendees. Login information is available at registration.

Cellular Phones

As a courtesy to fellow attendees, please silence electronic devices.

Conference App

Download the IEEE I2MTC 2019 app to enhance your Conference Experience. The app is available for Android, iOS, and Windows Phones. Search for "Whova" to download the app, then sync the IEEE I2MTC 2019 schedule.

Exhibits

Exhibits are located in the Atrium, Pre-Function Area and Annexe.

Exhibit Hours:

Tuesday, May 21	10:00 – 19:00
Wednesday, May 22	10:00 – 16:30
Thursday, May 23	10:00 – 17:00

Venue Map

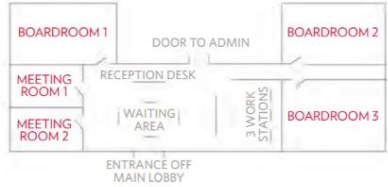
GROUND FLOOR

AUCKLANDER ROOM

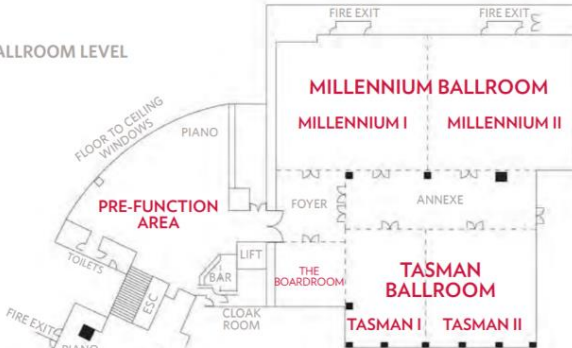


GROUND FLOOR

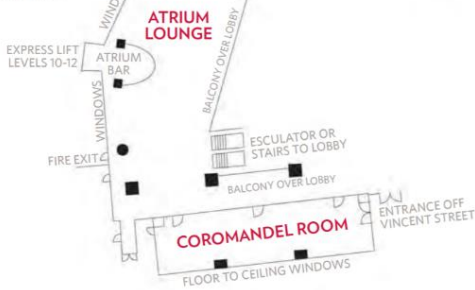
BUSINESS CENTRE



GRAND BALLROOM LEVEL

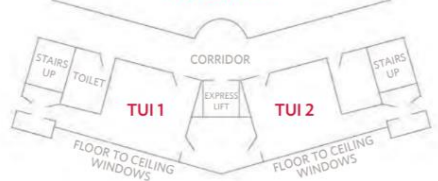


LEVEL 1



LEVEL 10

TUI SUITES



Q1
Instruments and
Instrumentation

Impact Factor
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IEEE Transactions on Instrumentation and Measurement (TIM) is the number 1 journal in the area of general Instrumentation and Measurement (I&M), according to the 2017 Journal Citation Report, with an Impact Factor of 2.794. Its Impact Factor without Self-Cites of 2.201 is also the best among general I&M journals. Furthermore, TIM is the only general I&M journal that is in Quartile 1 (Q1) of the Instruments and Instrumentation category. In addition, according to the 2017 Scopus report, TIM is the number 1 journal in the area of general I&M with a CiteScore of 3.47 and SJR of 0.938. In terms of timeliness, TIM's average duration of submission-to-first-decision and submission-to-online-publication of 57 days and 26 weeks, respectively, are among the very best in all of IEEE journals.

In addition to regular papers, TIM also publishes short papers and survey/review papers. **Short papers** are 2 or 3-page papers that are both reviewed faster and published faster than regular papers. When a short paper gets accepted, it is assigned to the very next issue that hasn't gone to print yet, providing authors with a means for rapid publication of novel, significant and time-sensitive articles. **Survey/review papers** review the existing literature on a specific topic, and present further contributions such as a novel taxonomy that will guide other researchers, deep analysis with new findings that were previously unknown, or identifying gaps and providing new insights.

IEEE TIM is the flagship publication of the IEEE Instrumentation and Measurement Society (IMS) and publishes papers that report on innovative solutions to the development and use of electrical, electronic, or software instruments and equipment to measure, monitor and/or record physical phenomena for the purpose of advancing measurement science, methods, functionality and applications.

For more info, please visit <http://tim.ieee-ims.org>

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PROGRAM SCHEDULE – Tutorials – Monday, May 20, 2019

8:00 – 17:30						
Registration					Tutorial Recording <i>Coromandel</i>	Ancillary Meeting: Chapter Summit <i>Auckland</i>
Measurements	Signal Acquisition, Processing and Quality	Measurements for Energy Industry	Sensor Calibration Techniques			
Morning Session #1 9:00 - 10:30	Bayesian Inference For Measurement Problems Markus Neumayer <i>Tasman 1</i>	Signal Acquisition From Conversion To Compression Asma Maalej, Manel Ben Romdhane & Dominique Dallet <i>Tasman 2</i>	Distributed Photonic Sensing For Power and Energy Industries Pawel Niewczas <i>Millennium 1</i>	Applying Metrological Techniques To Improve Microwave Measurements Blair Hall <i>Millennium 2</i>		
Morning Break 10:30 - 11:00						
Morning Session #2 11:00 - 12:30	Methodology Of Measurement Dario Petri <i>Tasman 1</i>	Signal Quality - From Wearables To Hospitals Mohamed Abdelazez & Sreeraman Rajan <i>Tasman 2</i>	Measuring Flicker Of Artificial Light Sources In The Home Chris Chitty & Susan Mander <i>Millennium 1</i>	Frequency Domain Sine-Wave Parameter Estimation Dominique Dallet & Daniel Belega <i>Millennium 2</i>		
Lunch 12:30 - 13:30						

	Measurements Basics	Measurement and Materials	Industrial Process Measurement	Measurement of Autonomous Systems		
Afternoon Session #1 13:30 - 15:00	Tutorial On Measurement Uncertainty Rod White <i>Tasman 1</i>	What is Impedance and Dielectric Spectroscopy? Rosario A. Gerhardt <i>Tasman 2</i>	Using FPGA Based Imaging For Low Latency Measurement Donald Bailey <i>Millennium 1</i>	Measurements Applications For Autonomous Systems Daniele Fontanelli <i>Millennium 2</i>	Tutorial Recording <i>Coromandel</i>	
Afternoon Break 15:00 - 15:30						
Afternoon Session #2 15:30 - 17:00	Intelligent Edge Computing Technology for Internet-of-Things (IoT) Zake Lin <i>Tasman 1</i>	Measurement Of Magnetism in Composite Materials - Towards Novel Magnetic Materials Bernardo Tellini <i>Tasman 2</i>	Electrical Capacitance Tomography: From Principle To Applications Wuqiang Yang <i>Millennium 1</i>	Uncertainty-Aware Design Of Measurement Systems Based On Drones Francesco Picariello & Luca De Vito <i>Millennium 2</i>		
Patron Session 17:00 - 17:30	VICOM Tutorial <i>Millennium 1</i>		Industrial Measurement Challenges and Practical Advice to Building Scalable Data Acquisition Systems Gerrald Carlo Mateo <i>Millennium 2</i>			
18:00 – 19:30	Tutorial/Young Professionals Reception <i>Pre Function Area/Annexe</i>					

PROGRAM SCHEDULE – Tuesday, May 21, 2019

07:00 – 19:00	Registration							
08:00 – 08:15	<i>Opening Ceremony</i> Millennium Ballroom							
08:15 – 09:15	Keynote Speaker: Dr. Alan Finkel <i>The Measure of an Incurable Engineer</i> Millennium Ballroom							
09:15 – 09:30	<i>Award Presentation:</i> <i>IEEE Joseph F. Keithley Award in Instrumentation and Measurement</i> Millennium Ballroom							
09:30 – 10:00	<i>Morning Tea</i> Atrium/Annexe							
10:00 – 12:00	<i>Advanced in Modern Instruments -1</i> Tasman 1	<i>Data Acquisition Systems - 1</i> Tasman 2	<i>Special Session 12: Advanced Measurement and Data Processing for Complex Engineering System Health Monitoring</i> Auckland	<i>Measurem ent Theory and Metrology - 1</i> Millennium 1	<i>Special Session 11A by TC-1: Measurement Methods and Instrumentation for Nondestructive Testing and Evaluation (NDT&E) and Structural Health Monitoring (SHM) - Organized by I&M Society Technical Committee</i> Millennium 2	Exhibits Open Atrium/ Annexe	Ancillary Meeting: TIM Associate Editor Meeting Coromandel	Ancillary Meeting: DL Evaluation Tui 2
12:00 - 13:00	<i>Lunch</i> Atrium/Annexe							

13:00 – 14:00	<p style="text-align: center;"><i>IEEE Instrumentation and Measurement Society</i> <i>J. Barry Oakes Advancement Award Recipient: Ali Foudazi</i> <i>Development of Active Microwave Thermography (AMT) for Nondestructive Testing and Evaluation (NDT&E) Applications</i> Millennium Ballroom</p>					<i>Exhibits Open</i> Atrium/ Annexe	Ancillary Meeting: DL Evaluation Tui 2
14:00 – 15:00	<p style="text-align: center;"><i>A Comprehensive Insight into Effective and Informed Archival Journal Publication Process</i> <i>Prof. Reza Zoughi</i> Millennium Ballroom</p>						
15:00 – 15:30	<p style="text-align: center;"><i>Afternoon Tea</i> Atrium/Annexe</p>						
15:30 – 17:30	<p><i>Best Paper Candidates</i> Tasman 1</p>	<p><i>Data Acquisition Systems - 2</i> Tasman 2</p>	<p><i>Special Session 5: Instrumentation and Measurement for Improving Quality, Reliability and Safety: New Perspectives for Research and Industry</i> Auckland</p>	<p><i>Aerospace</i> Millennium 1</p>	<p><i>Special Session 11B by TC-1: Measurement Methods and Instrumentation for Nondestructive Testing and Evaluation (NDT&E) and Structural Health Monitoring (SHM) - Organized by I&M Society Technical Committee</i> Millennium 2</p>		Ancillary Meeting: TC Meeting Coromandel
17:30 – 19:30	<p><i>TIM @ I2MTC</i> Atrium/Annexe</p>	<p><i>Welcome Reception</i> Atrium/Annexe</p>	<p><i>Tuesday Poster Session</i> Atrium/Annexe</p>				

PROGRAM SCHEDULE – Wednesday, May 22, 2019

07:00 – 16:30	Registration							
08:00 – 10:00	<i>Agriculture and Forestry - 1</i> Tasman 1	<i>Environment</i> Tasman 2	<i>Image Processing -1</i> Auckland	<i>Special Session 9: Power Quality Measurement Issues in Smart Grids</i> Millennium 1	<i>Mini-symposium on SI for the 21st Century</i> Millennium 2	<i>Exhibits Open</i> Atrium/ Annexe	Ancillary Meeting: “Meet the EiC” Coromandel	
10:00 - 10:30	<i>Morning Tea</i> Atrium/Annexe							
10:30 – 11:30	<i>Keynote Speaker: Dr. Michael de Podesta</i> <i>Redefining the Kilogram, the Kelvin, the Ampere and the Mole: Why You Should Care Even Though You Won't Notice</i> Millennium Ballroom							
11:30 – 12:00	<i>IEEE I2MTC 2019: Award Ceremony</i> Millennium Ballroom							
12:00 – 13:00	<i>Lunch</i> Atrium/Annexe							

13:00 - 15:00	<i>IEEE International Sensors and Measurement Student Contest</i> Auckland	<i>Wednesday Poster Session</i> Atrium/Annexe		<i>Late Result Poster Session</i> Atrium/Annexe			WIM Panel Coromandel	Ancillary Meeting: I2MTC 2020 Planning Meeting Tui 2
15:00 – 15:30	<i>Afternoon Tea</i> Atrium/Annexe							
15:30 – 17:30	<i>Special Session 13: Recent Advances in Fiber Optic Sensing: Sensors, Instrumentations, Measurements and Applications</i> Tasman 1	Networks and Measurements - 1 Tasman 2	<i>Special Session 2: Advanced Measurement and Instrumentation for NDT&E - 2</i> Auckland	<i>Energy and Power - 2</i> Millennium 1	<i>Student/ YP Panel</i> Millennium 2	<i>Exhibits Open</i> Atrium/ Annexe	Ancillary Meeting: I2MTC 2021 Planning Meeting Coromandel	
17:30 – 22:30	Gala Dinner Auckland War Memorial Museum Buses leave at 5:30 PM							

PROGRAM SCHEDULE – Thursday, May 23, 2019

07:00 – 16:30	Registration							
08:00 – 10:00	<i>Robotics</i> Tasman 1	<i>Non-Invasive Measurements - 1</i> Tasman 2	<i>Sensors and Transducers - 1</i> Aucklander	<i>Signal Processing - 1</i> Millennium 1	<i>Measurement for Medical, Biomedical and Healthcare - 1</i> Millennium 2		<i>Exhibits Open</i> Atrium/Annexe	Ancillary Meeting: 2019 Wrap Up Meeting <i>Coromandel</i>
10:00 – 10:30	<i>Morning Tea</i> Atrium/Annexe							
10:30 – 11:30	Keynote Speaker: Prof. Cather Simpson <i>Photonics Transforming 21st Century Sensing</i> Millennium Ballroom							
11:30 – 12:00	<i>I2MTC 2020: Presentations</i> Millennium Ballroom							
12:00 – 13:00	<i>Lunch</i> Atrium/Annexe						<i>Exhibits Open</i> Atrium/Annexe	I2MTC Board Meeting <i>Coromandel</i>
13:00 – 15:00	Industry 4.0 - 1 Tasman 1	Special Session 4: Capacitive Sensing in Harsh Environments by <i>TC-9</i> Tasman 2	<i>Sensors and Transducers - 2</i> Aucklander	<i>Signal Processing - 2</i> Millennium 1	<i>Special Session 6/7: Medical/Biological Instrumentation and Measurements for Ambient Intelligence Applications by TC-25</i> Millennium 2			
15:00 – 15:30	<i>Afternoon Tea</i> Atrium/Annexe							
15:30 – 17:30	<i>Thursday Poster Session</i> Atrium/Annexe							
17:30 – 18:00	Closing Ceremony/Sensors & Measurement Student Contest Awards Millennium Ballroom							

Technical Schedule: Tuesday, May 21

7:00 - 19:00

Registration

8:00 - 8:15

Opening Ceremony

Room: Millennium Ballroom

8:15 - 9:15

Keynote Speaker: Dr. Alan Finkel

The Measure of an Incurable Engineer

Room: Millennium Ballroom

9:15 - 9:30

IEEE Joseph F. Keithley Award in Instrumentation and Measurement Award Presentation

Room: Millennium Ballroom

9:30 - 10:00

Morning Tea

Room: Atrium/Annexe

10:00 – 12:00

TA1: Advances in Modern Instrumentation-1

Room: Tasman 1

1 pT-noise fluxgate magnetometer design and its performance in geomagnetic measurements

Michal Janosek (Czech Technical University in Prague, Czech Republic & Stellenbosch University, South Africa)

Mattia Butta (Czech Technical University in Prague, Czech Republic)

Michal Dressler (Czech Technical University in Prague, Czech Republic)

Elda Saunderson (South African National Space Agency, South Africa)

David Novotny (Czech Technical University in Prague, Czech Republic)

Coenrad Fourie (Stellenbosch University, South Africa)

Addressing Emerging Needs of Hi-Tech Industry: Collaborative Engineering Program in Electronic Testing, Instrumentation and Measurement

Serge Demidenko (Sunway University, Malaysia)

Melanie Ooi (Unitec Institute of Technology, New Zealand)

Moi Tin Chew (Massey University, New Zealand)

Ye Chow Kuang (University of Waikato & Monash University, New Zealand)

Arvind Rajan (Brookfield Scientific Solutions Group, Australia)

A 9 ps time interval digitizer based on pulse repetition and averaging

Ryszard Szplet (Military University of Technology, Poland)

Slawomir Jarzynski (Military University of Technology, Poland)

Time-to-Digital Converter with Pseudo-Segmented Delay Line

Pawel Kwiatkowski (Military University of Technology, Poland)

Ryszard Szplet (Military University of Technology, Poland)

A New F-PCASVD based Multivariate Denoising Algorithm for FID Transversal Data

Huan Liu (China University of Geosciences (Wuhan), P.R. China & University of British Columbia, Canada)

Haobin Dong (China University of Geosciences, P.R. China)

Jian Ge (China University of Geosciences, P.R. China)

Zheng Liu (University of British Columbia, Canada)

Hengli Song (China University of Geosciences, P.R. China)

Zhiwen Yuan (Science and Technology on Near-Surface Detection Laboratory, P.R. China)

Jun Zhu (Science and Technology on Near-Surface Detection Laboratory, P.R. China)

Haiyang Zhang (Science and Technology on Near-Surface Detection Laboratory, P.R. China)

A programmable bias current compensation approach in current noise measurement applications

Graziella Scandurra (University of Messina, Italy)

Gino Giusi (University of Messina, Italy)

Carmine Ciofi (University of Messina, Italy)

10:00 – 12:00

TA2: Data Acquisition Systems - 1

Room: Tasman 2

DAQ Golden Rules in the anti-aliasing Bessel filter vs. a trigger efficiency of the surface detector in the Pierre Auger Observatory

Zbigniew Szadkowski (University of Lodz & Faculty of High-Energy Astrophysics, Poland)

Anna Szadkowska (Lodz University of Technology, Poland)

A novel triggering technique for complex waveform based on the Hamming distance

Qinchuan Zhang (University of Electronic Science and Technology of China, P.R. China)

Min Li (Sichuan Normal University & College of Computer Science, P.R. China)

Peng Ding (University of Electronic Science and Technology of China, P.R. China)

Peng Ye (University of Electronic Science and Technology of China, P.R. China)

Experimental Characterization of the Energy Consumption of ADC Embedded into Microcontrollers Operating in Low Power

Ferran Reverter (Universitat Politècnica de Catalunya, Spain)

Manel Gasulla (Universitat Politècnica de Catalunya, Spain)

Explicit analysis of subADCs mismatch errors in band-interleaved ADC systems

Yu Zhao (University of Electronic Science and Technology of China, P.R. China)

Ye Peng (University of Electronic Science and Technology of China, P.R. China)

Jinpeng Song (University of Electronic Science and Technology of China & University of Wisconsin - Madison, P.R. China)

Jie Meng (University of Electronic Science and Technology of China, P.R. China)

Kuojun Yang (University of Electronic Science and Technology of China, P.R. China)

Jian Gao (University of Electronic Science and Technology of China, P.R. China)

Development of a Lithium-ion Battery Model and State of Charge Estimation Algorithm with Hardware-in-the-loop Validation

Juan Ramirez-Cortes (INAOE, Mexico)

James Marco, Marco (University of Warwick, United Kingdom (Great Britain))

Erik Martinez-Vera (Warwick University, United Kingdom (Great Britain))

Jose J. Rangel-Magdaleno (INAOE, Mexico)

High Precision Power Estimation with Non-Power Measurement Digital Multimeter using Adaptive Resolution Selection and Linear Interpolation

Sri Krishna (Robert Bosch Engineering and Business Solutions Pvt Ltd, India)

Gautham Vijayaragavan (Robert Bosch Engineering and Business Solutions Pvt Ltd, India)

10:00 - 12:00

TA3: Special Session 12: Advanced Measurement and Data Processing for Complex Engineering System Health Monitoring

Room: Aucklander

Nonnegative bounded convolutional sparsity learning algorithm for envelope blind deconvolution

Zhaohui Du (Northwestern Polytechnical University, P.R. China)

Han Zhang (Chang'an University, P.R. China)

Xuefeng Chen (Xian Jiaotong University, P.R. China)

Data-Driven Anomaly Detection of UAV based on Multimodal Regression Model

Benkuan Wang (Harbin Institute of Technology, P.R. China)

Datong Liu (Harbin Institute of Technology, P.R. China)

Xiyuan Peng (Harbin Institute of Technology, P.R. China)

Zhenyu Wang (Beijing Aerospace Unmanned Vehicles System Engineering Research Institute, P.R. China)

Series-connected lithium-ion battery pack health modeling with cell inconsistency evaluation

Yuchen Song (Harbin Institute of Technology, P.R. China)

Datong Liu (Harbin Institute of Technology, P.R. China)

Peng Yu (Harbin Institute of Technology, P.R. China)

Blade Tip Timing: from Raw Data to Parameters Identification

Shuming Wu (Xi'an JiaoTong University & State Key Laboratory for Manufacturing and Systems Engineering, P.R. China)

Xuefeng Chen (Xian Jiaotong University, P.R. China)

Pete Russhard (EMTD Measurement Ltd., United Kingdom (Great Britain))

Ruqiang Yan (Xi'an Jiaotong University, P.R. China)

Shibin Wang (The State Key Laboratory for Manufacturing Systems Engineering, Xi'an Jiaotong University, P.R. China)

Zhao Zhibin (Xi'an Jiaotong University, P.R. China)

Shaohua Tian (Xi'an Jiaotong University, P.R. China)

Bearing Fault Diagnosis Based on Visual Symmetrized Dot Pattern and CNNs

Hui Wang (Southeast University, P.R. China)

Jiawen Xu (Southeast University, P.R. China)

Ruqiang Yan (Xi'an Jiaotong University, P.R. China)

An Intelligent Compound Fault Diagnosis Method Using One-Dimensional Deep Convolutional Neural Network With Multi-Label Classifier

Ruyi Huang (South China University of Technology, P.R. China)

Weihua Li (South China University of Technology, P.R. China)

Lingli Cui (Beijing University of Technology, P.R. China)

10:00 - 12:00

TA4: Measurement Theory and Metrology -1

Room: Millennium 1

Optimal Measurements of Electromagnetic flowmeter

Xiaofeng Gao (Tianjin University, P.R. China)
Yue (Tianjin University, P.R. China)
Ziqiang Cui (Tianjin University, P.R. China)
Mingliang Ding (Tianjin University, P.R. China)
Qi Li (Tianjin University, P.R. China)
Huaxiang Wang (Tianjin University, P.R. China)

The Modern Measurement Challenge

Harold Kirkham (Pacific Northwest National Laboratory, USA)
D. White (Measurement Standards Laboratory of New Zealand, New Zealand)

Analysis of Multilayer Graphene as Verification Standard for VNA at Millimeter-Wave Frequencies

Noshewan Shoaib (Research Institute for Microwave and Millimeter-Wave Studies (RIMMS) & National University of Sciences and Technology (NUST), Pakistan)
Qammer H Abbasi (University of Glasgow, United Kingdom (Great Britain))

Passband frequency response measurement of a high voltage differential probe up to 10 MHz

Michael Grubmüller (Graz University of Technology, Austria)
Markus Neumayer (Graz University of Technology, Austria)

Improved Method of Excitation Signal in Transient Temperature Calibration System Based on Laser

Zhijie Zhang (North University of China, P.R. China)
Yanfeng Li (North University of China, P.R. China)
Hang Chen (North University of China, P.R. China)
Chenyang Zhao (North University of China & School of Instrument and Electronics, P.R. China)
Wuliang Yin (The University of Manchester, United Kingdom (Great Britain))

The Nature of the Measurement of Partial Discharge

Harold Kirkham (Pacific Northwest National Laboratory, USA)
D. White (Measurement Standards Laboratory of New Zealand, New Zealand)

10:00 – 12:00

TA5: Special Session 11A: Measurement Methods and Instrumentation for Nondestructive Testing and Evaluation (NDT&E) and Structural Health Monitoring (SHM) - Organized by I&M Society Technical Committee by TC-1

Room: Millennium 2

Structural Health Monitoring: Historical Development, Current Status, Research Needs

Charles Farrar (Los Alamos National Laboratory's (LANL) Engineering Institute)

Magnetic Flux Leakage Measurement System for Nondestructive Testing of Water-Cooled Wall

Hoyong Lee (Gwangju University, Korea)
Eunho Choe (Chosun University, Korea)
Jinyi Lee (Chosun University, Korea)
Gyejo Jung (Korea Electric Power Corporation, Korea)

Locating and Imaging Impact Damage with an Integrated System of PZT and Eddy Current Probe

Helena G. Ramos (Instituto de Telecomunicacoes, Instituto Superior Tecnico, Portugal)

Bo Feng (Instituto de Telecomunicações, Instituto Superior Técnico, Portugal)

Dario Pasadas (Instituto Telecomunicações & Instituto Superior Técnico, Portugal)

Artur L. Ribeiro (Instituto de Telecomunicações & Instituto Superior Técnico, University of Lisbon, Portugal)

High-Speed Inspection Method Fusing Pulsed Eddy Current and Magnetic Flux Leakage

Guanyu Piao (Tsinghua University, P.R. China)

Jingbo Guo (Tsinghua University, P.R. China)

Tiehua Hu (Tsinghua University, P.R. China)

Yiming Deng (Michigan State University, USA)

Multistatic Microwave Synthetic Aperture Radar (SAR) Imaging Using Orthogonal Binary Coding

Matthew Dvorsky (Missouri University of Science and Technology, USA)

John Gallion (Missouri University of Science and Technology, USA)

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

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

12:00 - 13:00

Lunch

Room: Atrium/Annexe

13:00 - 14:00

IEEE Instrumentation and Measurement Society

J. Barry Oakes Advancement Award Recipient: Ali Foudazi

Development of Active Microwave Thermography (AMT) for Nondestructive Testing and Evaluation (NDT&E) Applications

Room: Millennium Ballroom

14:00 - 15:00

A Comprehensive Insight into Effective and Informed Archival Journal Publication Process

Prof. Reza Zoughi

Room: Millennium Ballroom

15:00 - 15:30

Afternoon Tea

Room: Atrium/Annexe

Qualification of additive manufactured trabecular structures using a multi-instrumental approach

Roberto Montanini (University of Messina, Italy)
Gianluca Rossi (University of Perugia, Italy)
Franco Docchio (University of Brescia, Italy)
Enrico Primo Tomasini (Università Politecnica delle Marche, Italy)
Giovanna Sansoni (University of Brescia, Italy)
Simone Pasinetti (University of Brescia, Italy)
Antonino Quattrocchi (University of Messina, Italy)
Paolo Castellini (Università Politecnica delle Marche, Italy)
Paolo Chiariotti (Università Politecnica delle Marche, Italy)
Roberto Marsili (University of Perugia, Italy)
Gloria Allevi (University of Padova, Italy)
Roberto Rossetti (Università Politecnica delle Marche, Italy)

Data Fusion for Timber Bundle Volume Measurement

Marco Carratu' (University of Salerno, Italy)
Consolatina Liguori (University of Salerno, Italy)
Antonio Pietrosanto (University of Salerno & CEO of SPRING OFF srl, Italy)
Mattias O'Nils (Mid Sweden University, Sweden)
Jan Lundgren (Mid Sweden University, Sweden)

Distributed Fiber-optic Acoustic Sensor with Long Sensing Range over 100 km and Sub-nano Strain Resolution

Dian Chen (Shanghai Jiao Tong University, P.R. China)
Qingwen Liu (Shanghai Jiao Tong University, P.R. China)
Zuyuan He (Shanghai Jiao Tong University, P.R. China)

Millimeter Wave Differential Probe System for Surface Crack Detection in Painted Aircraft Fuselage

Yuan Gao (Missouri University of Science and Technology, USA)
Mohammad Tayeb Ghasr (Missouri University of Science and Technology, USA)
Kuang Ying (Missouri University of Science and Technology, USA)
Matthew Dvorsky (Missouri University of Science and Technology, USA)
Aaron Boots (Missouri University of Science and Technology, USA)
Reza Zoughi (Missouri University of Science and Technology, USA)
Donald Palmer (Boeing Research and Technology, USA)

Multimodal Lamb Wave Identification Using Combination of Instantaneous Frequency with EMD

Zhe Wang (Tsinghua University, P.R. China)
Songling Huang (Tsinghua University, P.R. China)
Hongyu Sun (Tsinghua University, P.R. China)
Shen Wang (Tsinghua University, P.R. China)
Qing Wang (Durham University, United Kingdom (Great Britain))
Wei Zhao (Tsinghua University, P.R. China)

15:30 - 17:30

TP2: Data Acquisition Systems - 2

Room: Tasman 2

A Versatile Low-Cost OS-based Phasor Measurement Unit

Carlo Guarnieri Calò Carducci (RWTH Aachen University, Germany)

Gianluca Lipari (RWTH Aachen University, Germany)

Nils Bosbach (RWTH Aachen University, Germany)

Tommaso Di Raimondo (University of Pisa, Italy)

Ferdinanda Ponci (RWTH Aachen University, Germany)

Antonello Monti (RWTH Aachen University & Institute for Automation of Complex Power Systems, Germany)

Low-noise instrumentation for electromagnetic groundwater flow measurement

Blair Bonnett (University of Canterbury, New Zealand)

Ben Mitchell (University of Canterbury, New Zealand)

Michael Frampton (University of Canterbury, New Zealand)

Michael Hayes (University of Canterbury, New Zealand)

Timer-based Demodulator for AM Square Signals coming from Sensor Circuits

Ferran Reverter (Universitat Politècnica de Catalunya, Spain)

Manel Gasulla (Universitat Politècnica de Catalunya, Spain)

Trigger based on a fuzzy logic for a detection of very inclined cosmic rays in the surface detector of the Pierre Auger Observatory

Zbigniew Szadkowski (University of Lodz & Faculty of High-Energy Astrophysics, Poland)

An Open Source PXIe Platform for Instrumentation Development

Robin Dykstra (Victoria University of Wellington, New Zealand)

Andrew Ang (Victoria University of Wellington, New Zealand)

Study on Multi-frequency Characteristics of Lung Cancer Conductivity

Jia Li (Tianjin University, P.R. China)

Yue (Tianjin University, P.R. China)

Mingliang Ding (Tianjin University, P.R. China)

Huaxiang Wang (Tianjin University, P.R. China)

15:30 - 17:30

TP3: Special Session 5: Instrumentation and measurement for improving quality, reliability and safety: new perspectives for research and industry

Room: Aucklander

A Low Cost Flexible Digital Twin Platform for Spacecraft Lithium-ion Battery Pack Degradation Assessment

Peng Yu (Harbin Institute of Technology, P.R. China)

Xulong Zhang (Harbin Institute of Technology, P.R. China)

Yuchen Song (Harbin Institute of Technology, P.R. China)

Datong Liu (Harbin Institute of Technology, P.R. China)

Sensor fusion for more accurate features in condition monitoring of mechatronic systems

Giulio D'Emilia (University of L'Aquila, Italy)

Emanuela Natale (University of L'Aquila, Italy)

Antonella Gaspari (University of L'Aquila, Italy)

Diagnostics for Temperature Sensors in Safety Instrumented Systems

Marcantonio Catelani (University of Florence, Italy)

Lorenzo Ciani (University of Florence, Italy)

Matteo Venzi (University of Florence, Italy)

An IFDI Scheme for Stroke Sensors in Motorcycle Semi-Active Suspension Systems

Marco Carratu' (University of Salerno, Italy)

Domenico Capriglione (University of Salerno, Italy)

Antonio Pietrosanto (University of Salerno & CEO of SPRING OFF srl, Italy)

Paolo Sommella (University of Salerno, Italy)

Improving context awareness reliability estimation for a wind turbine using an RBD model

Lorenzo Ciani (University of Florence, Italy)

Diego Galar (Luleå University of Technology, Sweden)

Gabriele Patrizi (University of Florence, Italy)

Gearbox Fault Diagnosis Based on VMD and Acoustic Emission Technology

Liquan Chen (Harbin Institute of Technology, P.R. China)

Liansheng Liu (Harbin Institute of Technology, P.R. China)

Min He (AVIC Chengdu Aircraft Industrial (Group) Co., Ltd., P.R. China)

Datong Liu (Harbin Institute of Technology, P.R. China)

15:30 – 17:30

TP4: Aerospace

Room: Millennium 1

Research on Lamb wave-mixing method to detect and locate the micro-cracks in plate

Chang Ma (Tianjin University, P.R. China)

Yibo Li (Tianjin University, P.R. China)

Xiaobo Rui (Tianjin University, P.R. China)

Shuo Zhang (Tianjin University, P.R. China)

Qiyang Xiao (Tianjin University, P.R. China)

Zhoumo Zeng (Tianjin University, P.R. China)

A Derivation of 3-D Error Propagation in Stereo Vision Tracking of Air Traffic used for the FAA Collision Risk Model

Shams Shahadat (University of Oklahoma, USA)

John Dyer (University of Oklahoma & MARIP, LLC, USA)

On-Wing Temperature Estimation and Control for Anti-Icing System on Aircraft

Harald Gietler (Alpen-Adria Universität, Austria)

Christian Stetco (Alpen-Adria Universität, Austria)

Juliana Leitzke (Alpen-Adria Universität, Austria)

Hubert Zangl (Alpen-Adria Universität, Austria)

Calibration of Sensor Pose Error in Aero-Engine Blade Measurement

Xiang Wei (Xi'an Jiaotong University, P.R. China)

Bing Li (Xi'an Jiaotong University, P.R. China)

Xiao Yan (Lanzhou Institute of Physics, P.R. China)

Lei Chen (Xi'an Jiaotong University, P.R. China)

Wenchao Su (Xi'an Jiaotong University, P.R. China)

Meiting Xin (Xi'an Jiaotong University, P.R. China)

Zhongyu Shang (Xi'an Jiaotong University, P.R. China)

Measurement and Validation of SVOM Satellite VHF Board to ground interface

Yang Liu (Shanghai Engineering Center for Microsatellites, P.R. China)
Shunjing YU (Shanghai Engineering Center for Microsatellites, P.R. China)
Yuanyuan Dai (Shanghai Engineering Center for Microsatellites, P.R. China)
Zongde Li (Shanghai Engineering Center for Microsatellites, P.R. China)
Xiaoyuan He (Shanghai Engineering Center for Microsatellites, P.R. China)
Xiaofeng Zhang (Shanghai Engineering Center for Microsatellites, P.R. China)

The Designing of Integrated Testing System for the Electric Power System in Large Civil Aircraft

Lei Tao (Northwestern Polytechnical University, P.R. China)
Yahui Liu (Northwestern Polytechnical University, P.R. China)
Hongjie Fu (Northwestern Polytechnical University, P.R. China)
Xiaobin Zhang (Northwestern Polytechnical University, P.R. China)

15:30 – 17:30

TP5: Special Session 11B: Measurement Methods and Instrumentation for Nondestructive Testing and Evaluation (NDT&E) and Structural Health Monitoring (SHM) - Organized by I&M Society Technical Committee by TC-1

Room: Millennium 2

Defect Feature Extraction in Eddy Current Testing Based on Convolutional Sparse Coding

Yang Tao (The University of Manchester, United Kingdom (Great Britain))
Wuliang Yin (The University of Manchester, United Kingdom (Great Britain))
Christos Ktistis (University of Manchester, United Kingdom (Great Britain))
Anthony Peyton (University of Manchester, United Kingdom (Great Britain))

Towards end-to-end pulsed eddy current classification and regression with CNN

Xin Fu (Wuhan University, P.R. China)
Chengkai Zhang (University of British Columbia, Canada)
Xiang Peng (University of British Columbia, Canada)
Lihua Jian (University of British Columbia, Canada)
Zheng Liu (University of British Columbia Okanagan, Canada)

Spatial Mapping of Complex Permittivity from Synthetic Aperture Radar (SAR) Images

Yuan Gao (Missouri University of Science and Technology, USA)
Mohammad Tayeb Ghasr (Missouri University of Science and Technology, USA)
Reza Zoughi (Missouri University of Science and Technology, USA)

Monitoring the Crack Growth by Measurement of Diffracted Lamb Waves

Artur L. Ribeiro (Instituto de Telecomunicações & Instituto Superior Técnico, University of Lisbon, Portugal)
Nuno Espada (Instituto Superior Técnico, Portugal)
Helena G. Ramos (Instituto de Telecomunicações, Instituto Superior Técnico, Portugal)
Bo Feng (Instituto de Telecomunicações, Instituto Superior Técnico, Portugal)

Active Microwave Thermography: A Real-Time Monitoring Tool for CFRP-Concrete Bond Testing

Ali Mirala (Missouri University of Science and Technology, USA)
Xingxing Zou (Missouri University of Science and Technology, USA)
Mohammad Tayeb Ghasr (Missouri University of Science and Technology, USA)
Lesley Sneed (Missouri University of Science and Technology, USA)
Kristen M Donnell (Missouri University of Science and Technology, USA)

Measurement of Inkjet-Printing Parameters for Accurate Chipless RFID Tag EM Simulation

Katelyn Brinker (Missouri University of Science and Technology, USA)

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

17:30 - 19:30

Welcome Reception

Room: Atrium/Annexe

17:30 - 19:30

TIMPS: IEEE TRANSACTIONS on I&M PAPERS

Room: Atrium/Annexe

1: Wireless Indoor Positioning With Vertically Uniform Alternating Magnetic Fields

Lixin Ran (Zhejiang University, P.R. China)

Xiaokang Qi (Zhejiang University, P.R. China)

Chao Ma (Zhejiang University, P.R. China)

Abstract: With the growing demands for localizing humans and mobile service robots, wireless indoor positioning has become a hot topic. Due to inevitable multipath scatterings in indoor spaces, technical challenges still exist. In this paper, we propose a new solution based on vertically uniform alternating magnetic fields. Such fields can be established by long coils driven by watt-level alternating currents with hertz-scale frequencies. Detected by commercial magnetic sensors, the coexisting dual-frequency magnetic fields are able to distribute in indoor spaces with tens of square meters. With 104-km-scale wavelengths, indoor obstacles can be considered as negligible Rayleigh scatters, and thus, this method is robust in complex indoor environments. Insensitive to height, the vertically polarized magnetic fields can be conveniently detected by existing smartphones, implying a human-oriented WIP based on smartphones. DOI: 10.1109/TIM.2018.2861118

2: Detection of Third Heart Sound Using Variational Mode Decomposition

Madhusudhan Mishra (Indian Institute of Technology, Kharagpur & NERIST, India)

Sanmitra Banerjee (Indian Institute of Technology Kharagpur, India)

Dennis Thomas (Indian Institute of Technology Kharagpur, India)

Sagnik Dutta (Indian Institute of Engineering Science and Technology Shibpur, India)

Anirban Mukherjee (Indian Institute of Technology Kharagpur, India)

Abstract: In this paper, a novel approach for the separation of heart and lung sounds (HLS) is proposed based on the nonlinear decomposition technique, variational mode decomposition (VMD) of phonocardiogram signal. Subjective validation and objective quantification are used to assess the performance of the method. The proposed technique is found to perform better than the conventional algorithms such as empirical mode decomposition (EMD), ensemble EMD, and different variants of the EMD. As the third heart sound, S3 is an important clinical sign of cardiac failure in elderly patients, a new technique is proposed for its detection. This method is built on the VMD and the smoothed pseudo Wigner-Ville distribution. In total, 40 sets of cardiac cycles containing S3 are obtained from publicly available databases and are used to evaluate the performance of the proposed method in noiseless condition. It is able to detect the S3 correctly even when the normalized amplitude of S3 is 14.1%, whereas the existing method based on the Hilbert variation decomposition requires at least 16.13% of the normalized amplitude of S3 in comparison to the normalized amplitude of the highest peak present in the cardiac cycle. In addition to this, the result shows that the proposed method can detect S3 in noisy cases up to SNR level of -5 dB. DOI: 10.1109/TIM.2018.2805198

3: A Cost-and-Time Effective Way to Determine Minimum Target Size of Micropower Impulse Radar Sensor

Vincent Tseng (Chung Yuan Christian University, Taiwan)

Abstract: It is necessary, and advantageous, to know the minimum target size (MTS) when assessing fitness between a sensor and a target for desired application. In the case of micropower impulse radar (MIR) sensor, due to its nature of being wide-band, it used to be difficult to estimate the MTS without utilizing complex mathematical modeling or implementing time-consuming direct measurement. This paper addresses the target size estimation task from a system-level approach and presents an alternative method that is simple in computation. This proposed method is based on the physics law of conservation of energy, and calls for transmission power, reception power, effective aperture of the receiving antenna, and electronic circuitry of receiver in formulation. The method is cost-and-time effective, when compared with direct measurement or mathematical modeling. The proposed method is evidenced to have an accuracy exceeding 90%, verified by a commercially available MIR system. DOI: 10.1109/TIM.2018.2877853

4: In-Motion Filter-QUEST Alignment for Strapdown Inertial Navigation Systems

Xiang Xu (Soochow University, P.R. China)

Abstract: By analyzing the error models of the measured vectors of the gravitational apparent motion, an in-motion filter-QUEST alignment method only with the inertial measurement unit is presented in this paper. The contribution of the proposed method lies in constructing the in-motion model of the measured vectors of the gravitational apparent motion and developing the extracted method to reconstruct the measured vectors. Furthermore, the relationship between the noise characteristic and the moving state of the vehicle is analyzed in detail. Different from the several current techniques, the presented method can be carried out without any other external additional equipment, when the vehicle is in-motion. With the designed real-time wavelet denoising (RWD) method, the high-frequency noises of the measured vectors are filtered. Based on the constructed parameter recognition model of the measured vectors, a robust adaptive Kalman filter is devised to estimate the optimal parameters, which are used to calculate the reconstructed observation vectors. Moreover, the gross outliers, which are contained in the filtered vectors of the RWD, are eliminated effectively. The simulation and the field trial results demonstrate that the presented method is applicable to the in-motion initial alignment, and it can serve as a nice initial alignment method in the follow-on fine alignment process and navigation process. DOI: 10.1109/TIM.2018.2805978

5: Design and Characterization of a Fringing Field Capacitive Soil Moisture Sensor

Manash Protim Goswami (Gauhati University, India)

Babak Montazer (Gauhati University, India)

Utpal Sarma (Gauhati University, India)

Abstract: This paper addresses the optimization and implementation of a fringing field capacitive soil moisture sensor using the printed circuit board technology. It includes the analysis of a novel configuration of an interdigital sensor for measuring soil moisture with two existing configurations. The optimized designs were simulated by using a 3-D finite-element method and fabricated by using a copper clad board. The performance of the fabricated sensors was evaluated using four soil samples collected from different locations. The observations were compared with the standard gravimetric method to evaluate the soil water content of the samples. The characterization method and the results of the whole sensing system are discussed in terms of calibration, dynamic test, and repeatability. <https://doi.org/10.1109/TIM.2018.2855538>

6: Condition Assessment of I&C Cables in Nuclear Power Plants via Stepped Frequency Waveform Reflectometry

Chun-Kwon Lee (Yonsei University, Korea)

Gu-Young Kwon (Yonsei University, Korea)

Yong-June Shin (Yonsei University, Korea)

Abstract: A nuclear power plant (NPP) depends on instrumentation and control (I&C) systems to ensure its safe and efficient operation. In particular, I&C cables take on the pivotal role of measuring and controlling the critical equipment of the NPP. Thus, it is indubitable that the diagnostic technology of I&C cables for detecting faults and accurately assessing their health status is required for ensuring the safety and reliability of NPP operation. We propose a diagnostic method that combines fault detection and evaluation algorithm for I&C cables with stepped frequency waveform reflectometry (SFWR) with signal propagation and reflection modeling. The signal modeling allows the assessment of the fault with an estimated reflection coefficient by separating the propagation and reflection effects of the measured signal. In short, cable faults are differentiated and quantified regardless of distance. The proposed algorithm is verified by characteristic impedance measurement, various fault detection/evaluation experiments and the fault evaluation of local accelerated thermal aging cable. DOI: 10.1109/TIM.2018.2834179 <https://ieeexplore.ieee.org/document/8376103>

7: Velocity Estimation From a Single Linear Motion Blurred Image Using Discrete Cosine Transform

Jimy A Cortes (Universidad Tecnologica de Pereira & Universidad Nacional de Colombia, Sede Manizales, Colombia)

Juan Gomez-Mendoza (Universidad Nacional de Colombia - INSA de Lyon, Colombia)

Juan Riaño-Rojas (Universidad Nacional de Colombia sede Manizales & PCM Computational Applications, Colombia)

Abstract: There is a growing trend to use a digital camera as an instrument to measure velocity instead of a regular sensor approach. This paper introduces a new proposal for estimating kinematic quantities, namely, the angle and the relative speed, from a single motion blur image using the discrete cosine transform (DCT). Motion blur is a common phenomenon present in images due to the relative movement between the camera and the objects, during sensor exposure to light. Today, this source of kinematic data is mostly dismissed. The introduced technique focuses on cases where the camera moves at a constant linear velocity while the background remains unchanged. 2250 motion blur pictures were shot for the angle experiments and 500 for the speed estimation experiments, in a light and distance controlled environment, using a belt motor slider driven at angles between 0° and 90° and 10 preset speeds. The DCT Hough and DCT Radon results were compared to discrete Fourier transform (DFT) Hough and DFT Radon algorithms for angle estimation. The mean absolute error of the DCT Radon method for direction estimation was 4.66° . In addition, the mean relative error for speed estimation of the DCT Pseudocepstrum was 5.15%. The innovative DCT frequency analysis proposals were more accurate than all competitors evaluated for the reconstruction of the point spread function that enables calculation of relative velocity and motion direction. These results demonstrate that cameras as an instrument can be used to measure velocity even using a single linear motion blur degraded image. DOI: <https://doi.org/10.1109/TIM.2018.2882261>

8: Pixels and 3-D Points Alignment Method for the Fusion of Camera and LiDAR Data

Shichao Xie (Tsinghua University, P.R. China)

Diange Yang (Tsinghua University, P.R. China)

Kun Jiang (Tsinghua University, P.R. China)

Yuanxin Zhong (University of Michigan, USA)

Abstract: The fusion of light detection and ranging (LiDAR) and camera data is a promising approach to improve the environmental perception and recognition for intelligent vehicles because of the combination of depth and color information. One of the difficulties in achieving the fusion is the accurate alignment of the 3-D points with the image pixels. Current methods of data alignment involve the steps of estimating the camera intrinsic parameters and developing a transformation matrix between the camera and LiDAR frame. The drawback of these methods is the accumulation of errors during the calculation of the camera intrinsic parameters and the transformation matrix. In order to improve the data alignment accuracy, we propose a novel algorithm that directly calculates the alignment between the 3-D points and the pixels without the need for camera parameters and calibration of the coordinate transformation matrix. We call the proposed method the pixel and 3-D point alignment (PPA) method. The alignment procedure is achieved by using the extracted corresponding points. First, we calculate a linear alignment matrix without considering the image distortion; and second, we optimize the parameters using the maximum likelihood estimation to consider the camera distortion. Simulation and experimental results indicate that the PPA method is able to align the 3-D points in LiDAR frame with the pixels in image frame with higher accuracy and increased robustness against noise in calibration process than comparable state-of-the-art methods. DOI:10.1109/TIM.2018.2879705

9: Time-of-Flight Range Image Measurement in the Presence of Transverse Motion Using the Kalman Filter

Lee Streeter (University of Waikato, New Zealand)

Abstract: Time-of-flight range imaging cameras measure distance to objects in their field of view, but are prone to error when objects move. At least three raw frames are required to obtain one range image, and the standard method is to read out raw frames into separate sets and process to find one range image per set. Motion during the acquisition of a set causes error in the corresponding range image. In this paper, the problem of motion is addressed by regarding the raw data from each pixel as a noisy time series, and using the Kalman filter to efficiently perform time-series analysis. The proposed method adapts to the effects of transverse motion, measuring a sharp range image at each raw frame. The error in the proposed method is less than the traditional approach in 80% of tests, with no detected increase in the STD due to noise. In the qualitative experimental results, the visible blur is reduced. DOI: 10.1109/TIM.2018.2800918

10: Evaluation of Experimental GNSS and 10-DOF MEMS IMU Measurements for Train Positioning

Jon Otegui Arruti (University of Deusto & DeustoTech, Spain)

Alfonso Bahillo (University of Deusto, Spain)

Abstract: Integrating new candidate sensors, such as Global Navigation Satellite System (GNSS) and inertial measurement unit (IMU), into fail-safe train positioning systems have recently become a prominent area of research. Although there are a number of contributions related to the design of data fusion algorithms, the lack of details in raw measurements analysis has directly motivated this paper. This paper aims to record data from a variety of sensors (such as GNSS, IMU, magnetometer, barometer, tachometers, and Doppler radars) to evaluate train velocity and railway features (track slope, curve cant, and radius) extending previous works in the instrumentation and measurement field. The field test designed and concisely described in this paper presents several challenging environments, such as a tunnel, which can be used to analyze the candidate sensors limitations. In addition, a demonstration of a data fusion algorithm is presented to calculate train velocity based on measurements from the candidate sensors. The results obtained by an extended Kalman filter using GNSS and IMU are compared with velocity recorded by tachometers and Doppler radars, which is considered to be the reference value. The calculated velocity by IMU and GNSS when both sensors measurements are available presents an absolute error in velocity lower than 2 km/h in more than 90% of test duration. Finally, railway features (curve radius, cant, and slope) are calculated and analyzed according to train and railway dynamics. 10.1109/TIM.2018.2838799

11: A spinning current circuit for Hall measurements down to the nanotesla range

Vincent Mosser (Issy Technology Center & Itron France, France)

Abstract: The spinning current modulation technique is shown not only to be able to suppress all the offset and low-frequency noise contributions from the Hall sensing element and its preamplifier, but it may also suppress the parasitic signals, such as pickup noise and thermal electromotive force contributed by the interconnects in a hybrid Hall plate/driving electronics system with remote Hall sensor head. The selection process of an adequate modulation sequence achieving this goal is detailed. The optimization of the elements involved in the analog circuitry, including the analog switches, differential amplifiers, filters, interconnects, and so on, for given measurement conditions is discussed. A printed circuit board aimed at optimizing the operating conditions for a broad spectrum of Hall sensor types and applications, using pluggable modules for adapting the gain and transfer function, is presented. The modulation sequence, modulation frequency, and fine-tuning of the delays involved in the spinning sequence are adjustable by software. With this circuit board and the optimized spinning sequence, we show that the parasitics originating from the interconnects in a hybrid Hall microsystem with remote sensor 1.5 m away can indeed be suppressed. We demonstrate an offset reduction by about four decades, from 630 μT down to less than 100 nT for a system with $\pm 35\text{-mT}$ full scale. The residual noise has a white spectrum down to at least 60 mHz, close to the Johnson-Nyquist thermal noise. A detectivity of 30 nT down to the sub-Hz range is demonstrated. DOI: 10.1109/TIM.2017.2649858

12: Power Quality Measurement System With PMU Functionality Based on Interpolated Sampling

Jan-Philipp Kitzig (Hochschule Ruhr West, Germany)

Sven Schlaghecke (Hochschule Ruhr West, Germany)

Gerd Bumiller (Hochschule Ruhr West & University of Applied Sciences, Germany)

Abstract: A power quality measurement system is introduced in this paper. While sampling with a high rate, it provides mains frequency synchronous voltage and current data in the form of 215 samples per cycle using a linear interpolation unit. The interpolation output sampling rate is provided by a mains frequency estimation unit, which conducts phase locking on the voltage measurements and additionally outputs the synchrophasor, frequency, and the rate of change of frequency. This algorithm is checked in simulations against the current standards, while discussing a phenomenon that is not yet taken into account by these standards: low-frequency interharmonic disturbances such as ripple control signals, which occur frequently in today's power grids. To desensitize the system toward these, compromises must be taken when it comes to standard compliance under transient conditions. Thereafter, first measurements with an evaluation system are analyzed to get a first impression of the system response to real signals. DOI: 10.1109/TIM.2018.2863458

13: Analysis of a Linearizing Direct Digitizer With Phase-Error Compensation for TMR Angular Position Sensor

Kishor Bhaskarrao Nandapurkar (Indian Institute of Technology Kaharagpur, India)

Chandrika Sreekantan Anoop (Indian Institute of Space Science and Technology, India)

Pranab K. Dutta (IIT Kharagpur, India)

Abstract: This paper proposes an efficient linearizing direct digitizer for tunneling magnetoresistance (TMR)-based angular position sensor. The proposed linearizing digitizer for TMR angle sensors (LDTA) converts sine and cosine natured analog outputs from the TMR sensor into a digital output that varies linearly over 360° range. The digitization is done without using any analog-to-digital converter. The novel methodology of the LDTA ensures that its performance is least affected by the phase error of the quadratic oscillator used for sensor excitation. This principle also prohibits the adverse effects of the parasitic capacitances of the TMR sensor on angle measurement. Error sources influencing the LDTA performance are identified and analyzed. Detailed simulation and emulation studies of the LDTA were conducted to confirm its methodology. The worst case nonlinearity spotted during emulation studies remains within 0.08% for various probable values of phase error. A TMR-based angle sensor unit is designed and built. Interfacing the LDTA with the developed sensor unit gives an output with worst case nonlinearity of 0.28% and minimal phase-error dependence. The performance of the LDTA is tested and quantified for various other scenarios, including dynamic input conditions and sensor unit imperfections. The superior performance of the LDTA to that of the existing techniques is also revealed in this paper. Digital Object Identifier 10.1109/TIM.2018.2810698.

14: Multiple Reflection Analysis of TDR Signal for Complex Dielectric Spectroscopy

Chih-Ping Lin (National Chiao Tung University, Taiwan)

Yin Jeh Ngui (National Chiao Tung University, Taiwan)

Chun-Hung Lin (National Sun Yat-sen University, Taiwan)

Abstract: Most dielectric spectroscopy techniques require careful system calibration, tedious measurement, specially designed probes, precise input source and some even involved complicated inversion models. This study proposed a rapid, robust and model-free multiple reflection analysis (MRA) of TDR signals to measure the complex dielectric permittivity (CDP) spectrum. The key to MRA approach is to decompose the first top reflection and the subsequent multiple reflections from TDR signal and to compare their spectral ratio (MRA ratio). This ratio was theoretically derived from the transmission line theory and found to be independent of source function and impedance mismatches in the leading sections. Based on this theoretical formulation, the CDP spectrum can be uniquely inverted from the measured MRA ratio through optimization and an iterated initial guess method. Numerical evaluations and experimental verifications had proven that MRA is a reliable algorithm for measuring CDP spectrum covering 10 MHz - 1 GHz. Factors influencing the reliable frequency region were discussed and recommendations on enhancing CDP measurement was proposed for highly dispersive materials. The MRA approach enables dielectric spectroscopy to be conveniently conducted in both laboratory and field, without complicated system setup and calibration. DOI: 10.1109/TIM.2018.2822404

15: FOCUS: Detecting ADHD Patients by an EEG-Based Serious Game

Shervin Shirmohammadi (University of Ottawa, Canada)

Alaa Eddin Alchalabi (University of Ottawa & Q Network Inc., Canada)

Amer Nour Eddin (Istanbul Sehir University, Turkey)

Mohamed Elsharnouby (Istanbul Sehir University, Turkey)

Abstract: Attention deficit hyperactivity disorder (ADHD), categorized by the lack of attention and focus, is one of the most common cognitive disorders. Since electroencephalogram (EEG) signals carry wide-ranging insights about cognition skills, the potential of using EEG signals to detect ADHD has a significant potential. EEG can be recorded utilizing wireless EEG reading devices often used by brain-computer interface researchers. In parallel-to-affordable EEG devices, serious games have been recently employed in the rehabilitation of multiple cognitive deficits. In this paper, we put the two things together, and we investigate the integration of an EEG-controlled serious game that trains and strengthens patients' attention ability while using machine learning to detect their attention level. Our pilot experiments with healthy individuals show an accuracy of up to 96% in classifying the EEG data to detect the correct game control type during gameplay, while our extended experiments with ADHD patients show an accuracy of up to 98% with a standard uncertainty of 0.16% in detecting ADHD patients. <https://doi.org/10.1109/TIM.2018.2838158>

16: Practical Aspects of Ultrasonic Rotary Encoder - Probe Placing, Real-Time Operation, and Automotive Bench Test

Shigeru Oho (Nippon Institute of Technology, Japan)

Abstract: The operational principle of an ultrasonic rotary encoder was investigated in order to examine the sensitivity of the measurement to the placement of the sensor probe. Ultrasound was sent to the moving blades attached to a rotating signal plate, and its amplitude and frequency were modulated by the blades. The sensor detected the modulated ultrasound, and the angle, speed, and angular velocity of the rotational motion were derived from the amplitude and frequency demodulation. Bragg's law of diffraction was adopted to explain how the mechanical motion affected the sound wave, and the diffraction was experimentally investigated. The moving blades examined were made of aluminum, cast iron, or plastic, all of which modulated the amplitude and frequency of the ultrasound, as predicted by the theory. Thus, the ultrasonic sensing method proposed is independent of the material of the rotating bodies, while the conventional magnetic method requires ferromagnetic material that tends to be heavy. The signal processing for the rotary encoder functions was implemented in a microcontroller to realize real-time operation and to build a stand-alone sensor. The sensor was tested on an automotive powertrain bench, and the result of rotation speed measurement agreed well with the reference result obtained from the instrumentation sensors in the test bench. DOI: 10.1109/TIM.2018.2874302

17: Estimation of the power quantities below one signal period using DFT coefficients

Dušan Agrež (University of Ljubljana, Slovenia)

Abstract: This paper proposes a method to estimate power quantities based on IEEE 1459-2010 using measurement window with length as close as possible to the length of the changing signal period and the non-parametric estimation approach in the frequency domain. Parameters are calculated from the largest local discrete Fourier transformation (DFT) coefficients of the particular frequency components. The improvement in reducing the influences of the harmonic components is the estimation around one signal period. When the time is shortened below the signal period, the DC coefficients of the DFT are taken into account using two Rife-Vincent windows class I with different orders. First, frequency is estimated by the quotient of the DC coefficients on the sampling points from the measurement interval of around half of the signal period, and upon this the fine estimation of the signal period, number of samples in this period, and belonging relative frequency with displacement can be effectively estimated. Effectiveness of estimations and tracking of the power quantities is demonstrated by simulations and on the real signals of the short circuit conditions in the power distribution system. doi: 10.1109/TIM.2018.2890181

18: Real-time image based defect inspection system of internal thread for nut

Chun-Fu Lin (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)

Sheng-Fuu Lin (Institute of Electrical Control Engineering, National Chiao Tung University, Taiwan)

Chi-Hung Hwang (Instrument Technology Research Center, Taiwan)

Tu Hao-Kai (National Chiao Tung University, Taiwan)

Shih-Yen Chen (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)

Chun-Jen Weng (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)

Abstract: The most important components of the internal nut thread inspection process are measuring the pitch and pitch diameter value and comparing these with their respective specifications, as a test nut is considered to be abnormal when its pitch or pitch diameter does not meet specifications. This paper focuses on defects arising when the pitch diameter does not meet its specification. Because conventional contact strategies are not suited to the real-time inspection of internal thread defects, there have been a number of recent attempts to develop noncontact methods for real-time measurement. Some approaches have applied laser triangulation techniques in which reflected light is used to measure the z-axis depth on an object's surface. Although point lasers have been shown to be highly precise in measuring pitch diameter, the optical architecture involved in these approaches is complicated and, as the laser must be scanned in a pointwise manner to derive cross-sectional measurements, the measurement process is too long to be compatible with real-time defect inspection. In this paper, an image-based method employing a line laser projector was used to develop a real-time image-based nut pitch diameter defect inspection system. The proposed method, which improves upon the conventional, widely used template-matching method for rapid defect detection, was shown to be effective through experimental validation. Digital Object Identifier 10.1109/TIM.2018.2872310

19: Reducing RF Distance Error by Characterizing Multipath

Ann Whitney (University of Kentucky, USA)

Johne Parker (University of Kentucky, USA)

Zach Kratzer (Lexmark International, USA)

John Fessler (Lexmark International, USA)

Julie Whitney (University of Kentucky, USA)

Abstract: This paper explores the ability of the received signal strength indicator versus frequency pattern (the RSSI signature) to reliably quantify the effect of environmental multipath on RSSI-derived distance measurements for passive Ultra-High Frequency systems. Radar technology has demonstrated the use of frequency information for range measurements, given an extremely large bandwidth. In this work, we show the applicability of these concepts to the Ultra-High Frequency Radio Frequency Identification spectrum and its narrow bandwidth. First, we present a theoretical model which illustrates the need for frequency information to separate multipath error from RSSI measurements. Practically, a closed-form method to extract the multipath component using data from a complex environment is not feasible; therefore, a neural network is used to emulate theoretical variable separation to extract measurement error due to multipath via information from the RSSI frequency signature. The subsequent predicted distance error relationship not only reduces the error magnitude, but also informs the direction of the error, thus making it possible to significantly improve the original distance prediction, even in a completely new environment. DOI: 10.1109/TIM.2018.2875899

20: Distributed Fiber-optic Acoustic Sensor with Long Sensing Range over 100 km and Sub-nano Strain Resolution

Dian Chen (Shanghai Jiao Tong University, P.R. China)
Qingwen Liu (Shanghai Jiao Tong University, P.R. China)
Zuyuan He (Shanghai Jiao Tong University, P.R. China)

21: Millimeter Wave Differential Probe System for Surface Crack Detection in Painted Aircraft Fuselage

Yuan Gao, Mohammad Tayeb Ghasr, Kuang Ying, Matthew Dvorsky and Aaron Boots (Missouri University of Science and Technology, USA)
Reza Zoughi (Missouri University of Science and Technology, USA)
Donald Palmer (Boeing Research and Technology, USA)

22: Multimodal Lamb Wave Identification Using Combination of Instantaneous Frequency with EMD

Zhe Wang, Songling Huang, Hongyu Sun and Shen Wang (Tsinghua University, P.R. China)
Qing Wang (Durham University, United Kingdom (Great Britain))
Wei Zhao (Tsinghua University, P.R. China)

23: High-accuracy distributed polarization crosstalk measurements based on white light interferometry

Haoliang Zhang (Harbin Engineering University, P.R. China)
Chengcheng Hou (Harbin Engineering University, P.R. China)
Jun Yang (Harbin Engineering University, P.R. China)
Zhangjun Yu (Harbin Engineering University, P.R. China)
Hanyang Li (Harbin Engineering University, P.R. China)
Yonggui Yuan (Harbin Engineering University, P.R. China)
Libo Yuan (Harbin Engineering University, P.R. China)

24: Classification of Spirometry Using Stacked Autoencoder based Neural Network

Sudipto Trivedy (Indian Institute of Technology Kharagpur, India)
Manish Goyal (All India Institute of Medical Sciences, India)
Madhusudhan Mishra (Indian Institute of Technology, Kharagpur & NERIST, India)
Narsingh Verma (King George's Medical University, India)
Anirban Mukherjee (Indian Institute of Technology Kharagpur, India)

25: Hybrid Multi-frequency Attitude Estimation Based on Vision/Inertial Integrated Measurement System

Yu Zhang (North University of China, P.R. China)
Xiaoting Guo (North University of China, P.R. China)
Chong Shen (North University of China, P.R. China)
Jun Tang (North University of China, P.R. China)
Jun Liu (North University of China, P.R. China)
Donghua Zhao (North University of China, P.R. China)

26: Magnetoresistance Measurement of Topological Quantum Materials in Pulsed High Magnetic Field

Qin Ying Liu (Huazhong University of Science and Technology, P.R. China)

27: Mass-Spring-Damper Model Optimized with PSO of the Fluidic System in Liquid-Circular Angular Accelerometer

Hujin Fu (Beijing Institute of Technology, P.R. China)

Meiling Wang (Beijing Institute of Technology, P.R. China)

Siyuan Cheng (School of Automation, Beijing Institute of Technology, P.R. China)

Tong Liu (Beijing Institute of Technology, P.R. China)

Xuan Xiao (Beijing Institute of Technology, P.R. China)

Meng-Yin Fu (Beijing Institute of Technology, P.R. China)

28: An FPGA-based Time Sampling Charge Measurement Method for TOF-PET Detectors

Bo Wu (University of Science and Technology of China, P.R. China)

Yonggang Wang (University of Science and Technology of China, P.R. China)

Qiang Cao (University of Science and Technology of China, P.R. China)

Jie Kuang (University of Science and Technology of China, P.R. China)

Mingchen Wang (University of Science and Technology of China, P.R. China)

Xiaoyu Zhou (University of Science and Technology of China, P.R. China)

29: Scanning Double-Beam Laser Interferometer with Loop-Back Compensation and Phase Stabilization

Michal Skalsky (Brno University of Technology, Czech Republic)

Jiří Fialka (Brno University of Technology & CEITEC, Czech Republic)

Zdeněk Havránek (Brno University of Technology, Czech Republic)

17:30 – 19:30

TPS: Tuesday Poster Session

Room: Atrium/Annexe

30: Research on a TCM-based Transmission Approach for EM-MWD by Combining Phase Modulation and Convolutional Coding

Cheng Zhang (China University of Geosciences, P.R. China)

Haobin Dong (China University of Geosciences, P.R. China)

Jian Ge (China University of Geosciences, P.R. China)

Huan Liu (China University of Geosciences (Wuhan), P.R. China & University of British Columbia, Canada)

Jiahao Wang (China University of Geosciences, P.R. China)

Wang Luo (China University of Geosciences, P.R. China)

Zhiwen Yuan (Science and Technology on Near-Surface Detection Laboratory, P.R. China)

Jun Zhu (Science and Technology on Near-Surface Detection Laboratory, P.R. China)

Haiyang Zhang (Science and Technology on Near-Surface Detection Laboratory, P.R. China)

31: Non-destructive testing method for substation grounding grid based on electromagnetic method

Xuan Yang (China University of Geosciences, P.R. China)

Haobin Dong (China University of Geosciences, P.R. China)

Hengli Song (China University of Geosciences, P.R. China)

32: Decoupling control on air-conditioning system with combined radiant cooling and independent fresh air

Yongguang Tan (Tianjin University, P.R. China)

Yue (Tianjin University, P.R. China)

33: Innovative sensing technologies for nuclear instrumentation

Patrick Calderoni (Idaho National Laboratory, USA)
David Hurley (Idaho National Lab, USA)
Joshua E Daw (Idaho National Laboratory, USA)
Austin Fleming (Idaho National Laboratory, USA)
Kelly McCary (Idaho National Laboratory, USA)

34: Impedance Measurement of Batteries under load

Rahat Hasan (University of Waikato, New Zealand)
Jonathan Scott (The University of Waikato, New Zealand)

35: Feature extraction based on optimal Morlet wavelet for the pressure oscillation induced by vapor condensation in a sonic nozzle

Hongbing Ding (Tianjin University, P.R. China)
Yiming Li (Tianjin University, P.R. China)
Jinxia Li (Tianjin University, P.R. China)
Peijuan Cao (Tianjin University & National Institute of Metrology, P.R. China)
Hongjun Sun (Tianjin University, P.R. China)

36: Intra-Quantum Signal Acquisition Using Software Defined Radios

Baptiste Laporte-Fauret (IMS Laboratory - University Bordeaux & THALES, France)
Guillaume Ferré (IMS Laboratory - University Bordeaux, France)
Dominique Dallet (IMS Laboratory - University Bordeaux, France)
Bryce Minger (THALES, France)
Loïc Fuché (THALES, France)

37: Measurement for fractional characteristic of Lithium batteries

Rahat Hasan (University of Waikato, New Zealand)
Jonathan Scott (The University of Waikato, New Zealand)

38: FPGA Implementation of a Complex Permeability Measurement Instrument

Yafeng Hu (Tianjin University, P.R. China)
Ziqiang Cui (Tianjin University, P.R. China)
Weiyang Zhang (Tianjin University, P.R. China)
Huaxiang Wang (Tianjin University, P.R. China)
Lifeng Zhang (North China Electric Power University, P.R. China)

39: A Novel Wideband High-speed Data Acquisition System Correction Method

Yi Zhou (University Of Electronic Science And Technology Of China, P.R. China)
Peng Ye (University of Electronic Science and Technology of China, P.R. China)
Kuojun Yang (University of Electronic Science and Technology of China, P.R. China)

40: Flash Floods Prediction using Real Time data: An Implementation of ANN-PSO with less False Alarm

Faraz Shaikh (International Islamic University Malaysia, Malaysia)
Talha Ahmed Khan (Universiti Kuala Lumpur, Malaysia)
Muhammad Alam (Ilma University, UniKL, Pakistan)
Sheroz Khan (International Islamic University Malaysia, Malaysia)
Kushsairy Kadir (Universiti Kuala Lumpur British Malaysian Institute, Malaysia)
Zeeshan Shahid (IIUM, Malaysia)
Mazliham Mohd Suud (Universiti Kuala Lumpur, Malaysia)
Muhammad Yahya (Universiti Kuala Lumpur, Malaysia)

41: Passive RFID tags for Metallic Environments Using Phased Array Reader Antennas

Sohel Patel (Missouri University of Science and Technology, USA)
Maciej Zawodniok (Missouri University of Science and Technology, USA)

42: Numerical Study of Pipework Arrangement Effects on Flow Rate Fed into Calibrated Flowmeter

Yihao Du (Nanjing University of Aeronautics and Astronautics, P.R. China)
Bin Wang (Nanjing University of Aeronautics and Astronautics, P.R. China)
Nanyue Xu (Nanjing University of Aeronautics and Astronautics, P.R. China)

43: Research on over-reading correlation for Venturi nozzle in wet gas two-phase flow

Zhuang Ma (School of Electrical and Information Engineering, Tianjin University, P.R. China)
Ying Xu (Tianjin University, P.R. China)
Tao Zhang (Tianjin University, P.R. China)
Yi-Guang Yang (Tianjin University, P.R. China)

44: Water volume fraction measurement with hydrocyclone-capacitor sensor in horizontal gas-liquid swirling flow

Ying Xu (Tianjin University, P.R. China)
Chen Bian (Tianjin University, P.R. China)
Tao Zhang (Tianjin University, P.R. China)
Jinghan Wang (Tianjin University, P.R. China)
Yi-Guang Yang (Tianjin University, P.R. China)

45: Research on the Pressure drop Characteristics of Spiral flow in Horizontal Straight Pipe

Xiaoqian Huo (Tianjin University, P.R. China)
Ying Xu (Tianjin University, P.R. China)
Tao Zhang (Tianjin University, P.R. China)
Jinghan Wang (Tianjin University, P.R. China)
Huaxiang Wang (Tianjin University, P.R. China)

46: Electrical Model for Lipase Immobilized PMMA Coated Sensor to Detect Fat Content in Milk

Moupali Chakraborty (Indian Institute of Technology, Kharagpur, India)
Karabi Biswas (I.I.T. Kharagpur, India)

47: Metrology for the factory of the future: towards a case study in condition monitoring

Tanja Dorst (Physikalisch-Technische Bundesanstalt, Germany)
Björn Ludwig (Physikalisch-Technische Bundesanstalt, Germany)
Sascha Eichstädt (Physikalisch-Technische Bundesanstalt, Germany)
Tizian Schneider (Saarland University & Center for Mechatronics and Automation Technology (ZeMA), Germany)
Andreas Schütze (Saarland University, Germany)

48: Effect of Pressure on the Wave Behavior in Horizontal Wet-gas Annular Flow

Ning Zhao (Tianjin University, P.R. China)
Yan Zhu (Hebei University, P.R. China)
Lina Niu (Measurement Supervision and Testing Institute of Hebei Province, P.R. China)
Zeng Qiaoqiao (Hebei University, P.R. China)
Lide Fang (Hebei University, P.R. China)
Xiaoting Li (Hebei University, P.R. China)

59: Time-Resolved Spectral Measurement for Fluorescence Analysis

Mitsunori Saito (Ryukoku University, Japan)
Takahiro Koketsu (Ryukoku University, Japan)
Yusuke Itai (Ryukoku University, Japan)

50: Optical Feedback into a Superluminescent Diode Cavity for Absolute Distance Measurements

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

Luca Di Cecilia (University of Modena and Reggio Emilia, Italy)

Stefano Cattini (University of Modena and Reggio Emilia & Science & Technology Park for Medicine, Mirandola, Modena, Italy)

51: Concrete fatigue experiment for sensor prototyping and validation of industrial SHM trials

Jack McAlorum (University of Strathclyde, United Kingdom (Great Britain))

Grzegorz Fusiek (University of Strathclyde, United Kingdom (Great Britain))

Tim Rubert (University of Strathclyde, United Kingdom (Great Britain))

Pawel Niewczas (University of Strathclyde & Synaptec Ltd, United Kingdom (Great Britain))

52: A Novel Instrument for Measuring the Grid Gap Separation Distance on a Firing Ion Engine

Michael A Campbell (National Physical Laboratory, United Kingdom (Great Britain))

Giovanni Mattia Lazzerini (National Physical Laboratory, United Kingdom (Great Britain))

Ben Hughes (National Physical Laboratory, United Kingdom (Great Britain))

Francis Lockwood Estrin (QinetiQ, United Kingdom (Great Britain))

Nick Kay (National Physical Laboratory, United Kingdom (Great Britain))

Jaime Perez Luna (QinetiQ, United Kingdom (Great Britain))

53: Experience-independent fingerprint imaging using a dark-field ring light illumination system

Yu-Hsuan Lin (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)

Hsin-Yi Tsai (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)

Chun-Han Chou (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)

Kuo-Cheng Huang (Instrument Technology Research Center, Taiwan)

Rou-Jhen Chen (Instrument Technology Research Center National Applied Research Laboratories, Taiwan)

54: Evaluation of water content and water retention capacity of contact lens by optical reflective measurement

Hsin-Yi Tsai (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)

Chia-Lien Ma (Instrument Technology Research Center, Taiwan)

Yu Hsuan Lin (Instrument Technology Research Center, Taiwan)

Fang-Ci Su (Instrument Technology Research Center, Taiwan)

Kuo-Cheng Huang (Instrument Technology Research Center, Taiwan)

55: Characteristics of the multi-transducer point-focusing fan-shaped PPM Shear-Horizontal wave EMATs for plate inspection

Hongyu Sun (Tsinghua University, P.R. China)

Songling Huang (Tsinghua University, P.R. China)

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

Wei Zhao (Tsinghua University, P.R. China)

56: A 3-D Pseudo Magnetic Flux Leakage (PMFL) Signal Processing Technique for Defect Imaging

Lisha Peng (Tsinghua University, P.R. China)

Songling Huang (Tsinghua university, P.R. China)

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

Wei Zhao (Tsinghua University, P.R. China)

57: Measurement of CFRP surface crack based on electromagnetic measuring system

Qian Zhao (Qufu Normal University, P.R. China)
Kai Zhang (Qufu Normal University, P.R. China)
Hanyang Xu (University of Manchester, United Kingdom (Great Britain))
Dianguo Cao (Qufu Normal University, P.R. China)
Jorge R. Salas Avila (The University of Manchester, United Kingdom (Great Britain))
Mingquan Wang (North University of China, P.R. China)
Yan Han (North University of China, P.R. China)
Zhijie Zhang (North University of China, P.R. China)
Wuliang Yin (The University of Manchester, United Kingdom (Great Britain))

58: Comparison of Scanning-Type Magnetic Cameras for Heat Exchanger Tube Inspection and their Applications

Hoyong Lee (Gwangju University, Korea)
Sunbo Sim (Chosun University, Korea)
Jinyi Lee (Chosun University, Korea)

59: A clustering low-rank approach for aero-enging bearing fault detection

Han Zhang (Chang'an University, P.R. China)
Xuefeng Chen (Xian Jiaotong University, P.R. China)
Xiaoli Zhang (Chang'an University, P.R. China)

60: A Fault Diagnosis Model Based on Kernel Auto-encoder and Improved Chaos Firefly Optimization Algorithm

Fengtao Wang (Dalian University of Technology, P.R. China)
Xiaofei Liu (Dalian University of Technology, P.R. China)
Linjie Ma (Dalian University of Technology, P.R. China)
Gang Deng (Dalian University of Technology, P.R. China)
Qingkai Han (Dalian University of Technology, P.R. China)
Hongkun Li (Dalian University of Technology, P.R. China)

61: A Precision Reliability Measurement in a S-Band Transponder for Space Applications

Enrico Petritoli (Università degli Studi "Roma Tre", Italy)
Fabio Leccese ("Roma Tre" University, Italy)
Lorenzo Ciani (University of Florence, Italy)

62: Automatic crack detection using eddy current sensor based on feature extraction

Yang Tao (The University of Manchester, United Kingdom (Great Britain))
Wuliang Yin (The University of Manchester, United Kingdom (Great Britain))

63: Frugal Data Acquisition and Transmission based on 1-bit Compressive Sensing for Structural Health Monitoring

Kai Chen (University of Electronic Science and Technology of China, P.R. China)
Changjian Liu (University of Electronic Science and Technology of China, P.R. China)
Yifan Wang (University of Electronic Science and Technology of China, P.R. China)
Xuan Gou (University of Electronic Science and Technology of China, P.R. China)
Bo Xu (University of Electronic Science and Technology of China, P.R. China)
Houjun Wang (University of Electronic Science and Technology of China, P.R. China)

64: Lithium-ion battery state of health monitoring based on ensemble learning

Yuanyuan Li (University of Electronic Science and Technology of China, P.R. China)
Hanmin Sheng (University of Electronic Science and Technology of China, P.R. China)
Yuhua Cheng (University of Electronic Science and Technology of China & School of Automation Engineering, P.R. China)
Hongjun Kuang (University of Electronic Science and Technology of China, P.R. China)

65: Measurement of Luders band of cast iron material based on 3d-DIC de-correlation effect

Hengrui Cui (Tianjin University, P.R. China)
Zhoumo Zeng (Tianjin University, P.R. China)
Hui Zhang (Tianjin University, P.R. China)
Qiyang Xiao (Tianjin University, P.R. China)
Jian Li (Tianjin University, P.R. China)
Chang Ma (Tianjin University, P.R. China)

66: Automatic Segment Assembly Method of Shield Tunneling Machine Based on Multiple Optoelectronic Sensors

Zhiyang Wu (Tianjin University, P.R. China)
Shuang Wang (Tianjin University, P.R. China)
Junfeng Jiang, Kun Liu (Tianjin University, P.R. China)
Jinshi Zhang (Tianjin University, P.R. China)
Zhiyang Wu (Tianjin University, P.R. China)
Kaixian Dong (Tianjin University, P.R. China)
Tiegen Liu (Tianjin University, P.R. China)

67: Health Indicator Extraction for Electro-Mechanical Actuator with CHMM

Yujie Zhang (Harbin Institute of Technology, P.R. China)
Liansheng Liu (Harbin Institute of Technology, P.R. China)
Min He (AVIC Chengdu Aircraft Industrial (Group) Co., Ltd., P.R. China)
Dangxia Lyu (AVIC Chengdu Aircraft Industrial (Group) Co., Ltd., P.R. China)
Peng Yu (Harbin Institute of Technology, P.R. China)
Datong Liu (Harbin Institute of Technology, P.R. China)

68: Secondary Peak Separation of Remote Field Eddy Current Testing in Ferromagnetic Pipes

Hu Sun (University of Electronic Science and Technology of China, P.R. China)
Yibing Shi (University of Electronic Science and Technology of China, P.R. China)
Xuyang Gao (University of Electronic Science and Technology of China, P.R. China)
Wei Zhang (University of Electronic Science and Technology of China, P.R. China)

69: A Method for Identifying Inclined Defects by Using Magnetic Flux Leakage Spectral Envelope Detection

Songling Huang (Tsinghua University, P.R. China)
Yue Long (Tsinghua University, P.R. China)
Shen Wang (Tsinghua University, P.R. China)
Wei Zhao (Tsinghua University, P.R. China)

Technical Schedule: Wednesday, May 22

7:00 - 16:30

Registration

8:00 – 10:00

WA1: Agriculture and Forestry - 1

Room: Tasman 1

Vision-Based Deep Learning Approach for Real-Time Detection of Weeds in Organic Farming

Vitali Czymmek (West Coast University of Applied Sciences, Germany)

Leif Ole Harders (West Coast University of Applied Sciences, Germany)

Florian Johannes Knoll (West Coast University, Germany)

Stephan Hussmann (West Coast University of Applied Sciences, Germany)

Evaluation of Deep Neural Network and Alternating Decision Tree for Kiwifruit Detection

Ye Chow Kuang (University of Waikato & Monash University, New Zealand)

Lee Streeter (University of Waikato, New Zealand)

Michael J. Cree (Waikato University, New Zealand)

Melanie Ooi (Unitec Institute of Technology, New Zealand)

Proximal Near-Infrared Spectral Reflectance Characterisation of Weeds Species in New Zealand Pasture

Wayne Holmes (Unitec Institute of Technology, New Zealand)

Melanie Ooi (Unitec Institute of Technology, New Zealand)

Ye Chow Kuang (University of Waikato & Monash University, New Zealand)

Ray Simpkin (Callaghan Innovation, New Zealand)

Dan Blanchon (Unitec Institute of Technology, New Zealand)

Morgan Look (Unitec Institute of Technology, New Zealand)

Serge Demidenko (Sunway University, Malaysia)

System Identification - Soilless Growth of Tomatoes

Dmitrii Shadrin (Skolkovo Institute of Science and Technology, Russia)

Artem Chashchin (Skolkovo Institute of Science and Technology, Russia)

Georgii Ovchinnikov (Skolkovo Institute of Science and Technology, Russia)

Andrey Somov (Skolkovo Institute of Science and Technology, Russia)

Contactless Electric Fence Fault Detection System

Ibrahim Al-Bahadly (Massey University, New Zealand)

Development and verification of the coaxial heterogeneous hyperspectral system for the Wax Apple tree

Yi-Sheng Li (National Chiao Tung University, Taiwan)

Yung-Jhe Yan (National Chiao Tung University, Taiwan)

Ruei-Siang Shih (National Chiao Tung University, Taiwan)

Chao-Hsin Chang (National Chiao Tung University, Taiwan)

Tzung-Cheng Chen (Chang Jung Christian University, Taiwan)

Yi-Chun Chen (National Chiao Tung University, Taiwan)

Chi Cho Huang (Taiwan Agricultural Research Institute, Taiwan)

Shiou-Gwo Lin (National Taiwan Ocean University, Taiwan)

Mang Ou-Yang (National Chiao-Tung University, Taiwan)

8:00 – 10:00

WA2: Environment

Room: Tasman 2

Tank-tests of a Prototype Electromagnetic Groundwater Flowmeter

Michael Hayes (University of Canterbury, New Zealand)
Ben Mitchell (University of Canterbury, New Zealand)
Blair Bonnett (University of Canterbury, New Zealand)
Michael Frampton (University of Canterbury, New Zealand)
Bill Heffernan (University of Canterbury, New Zealand)

Capacitive Sensing for Measuring Oil Thickness Under Fouling Conditions

Mahdi Saleh (American University of Beirut, Lebanon)
Imad H Elhadj (American University of Beirut, Lebanon)
Daniel Asmar (American University of Beirut, Lebanon)

An Opportunistic Approach for Mitigating Fouling in the Measurement of Oil Thickness

Mahdi Saleh (American University of Beirut, Lebanon)
Imad H Elhadj (American University of Beirut, Lebanon)
Daniel Asmar (American University of Beirut, Lebanon)

A Proposal for a Data Concentrator for Smart City Applications

Paolo Castello (University of Cagliari, Italy)
Carlo Muscas (University of Cagliari, Italy)
Paolo Attilio Pegoraro (University of Cagliari, Italy)
Sara Sulis (University of Cagliari, Italy)

Digital Urea Meter for Impedometric Urea Sensor

Asmita Bose (IIT Kharagpur, India)
Karabi Biswas (I.I.T. Kharagpur, India)

Polyimide coated Fabry-Perot humidity sensor

Stefaan Janssens (Callaghan Innovation, New Zealand)
Sebastiampillai Raymond (Callaghan Innovation, New Zealand)
Adam Swanson (Callaghan Innovation, New Zealand)

8:00 - 10:00

WA3: Image Processing -1

Room: Aucklander

Application of Asymmetric Fuzzy Linear Programming in EIT

Mingliang Ding (Tianjin University, P.R. China)
Yue (Tianjin University, P.R. China)
Jia Li (Tianjin University, P.R. China)
Yaru Yaru Wang (Tianjin University, P.R. China)
Xiaofeng Gao (Tianjin University, P.R. China)
Huaxiang Wang (Tianjin University, P.R. China)

A Small Infrared Target Detection Method Using Adaptive Local Contrast Measurement

Jingli Yang (Harbin Institute of Technology, P.R. China)
Yanfeng Gu (Harbin Institute of Technology, P.R. China)
Zhen Sun (Harbin Institute of Technology, P.R. China)
Zheng Cui (Harbin Institute of Technology, P.R. China)

Classification of diffuse liver diseases based on ultrasound images with multimodal features

Dandan Li (Harbin Institute of Technology & None, P.R. China)
Huanhuan Miao (The Second Affiliated Hospital of Harbin Medical University, P.R. China)
Xiang Li (Harbin Institute of Technology, P.R. China)
Yu Jiang (Harbin Institute of Technology, P.R. China)
Jing Jin (Harbin institute of Technology, P.R. China)
Shen Yi (Harbin Institute of Technology, P.R. China)

Enhancing the Performance of A Rainfall Measurement System Using Artificial Neural Networks based Object Tracking Algorithms

Lijuan Wang (North China Electric Power University, P.R. China)
Chih-Yen Chen (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Chi-Hung Hwang (Instrument Technology Research Center, Taiwan)
Chi-Wen Hsieh (National Chiayi University, Taiwan)
Po-Wei Chi (National Chiayi University, Taiwan)

A comparison of intelligent classifiers of thermal patterns in diabetic foot

Israel Cruz-Vega (CONACYT-INAOE, Mexico)
Hayde Peregrina-Barreto (Instituto Nacional de Astrofísica, Óptica y Electrónica, Mexico)
Jose J. Rangel-Magdaleno (INAOE, Mexico)
Juan Ramirez-Cortes (INAOE, Mexico)

Parallelized Fuzzy RBF and FHM based Color Filtering for Real-Time Image Processing

Balazs Tusor (Óbuda University, Hungary & J Selye University, Slovakia)
József Bukor (J. Selye University, Slovakia)
Annamária R. Várkonyi-Kóczy (Óbuda University, Hungary)

8:00 – 10:00

WA4: Special Session 9: Power Quality Measurement Issues in Smart Grids

Room: Millennium 1

An Arbitrary Harmonics Generating Power Source for Power Quality Measurement Devices

Wenwen Zhou (PONOVO Power Co., Ltd, P.R. China)

Resolving the reactive power question

Harold Kirkham (Pacific Northwest National Laboratory, USA)
Alexander Emanuel (Worcester Polytechnic University, USA)
Mihaela Albu (Politehnica University of Bucharest, Romania)
David Laverty (Queen's University Belfast, United Kingdom (Great Britain))

Discussion on DC and AC Power Quality Assessment in Railway Traction Supply Systems

Antonio Delle Femine (University of Campania Luigi Vanvitelli, Italy)
Daniele Gallo (University of Campania Luigi Vanvitelli, Italy)
Carmine Landi (University of Campania Luigi Vanvitelli, Italy)
Mario Luiso (University of Campania Luigi Vanvitelli, Italy)

Evaluation of Power Quality Measurement System Concept using an experimental setup

Jan-Philipp Kitzig (Hochschule Ruhr West, Germany)
Gerd Bumiller (Hochschule Ruhr West & University of Applied Sciences, Germany)

Improving the Accuracy of Current Transformers through Harmonic Distortion Compensation

Christian Laurano (Politecnico di Milano, Italy)

Sergio Toscani (Politecnico di Milano, Italy)

Michele Zanoni (Politecnico di Milano, Italy)

Harmonic Phasor Measurements in Real-World PMU-Based Acquisitions

Guglielmo Frigo (École Polytechnique Fédérale de Lausanne (EPFL), Switzerland)

Asja Derviskadic (École Polytechnique Fédérale de Lausanne (EPFL), Switzerland)

Paolo Attilio Pegoraro (University of Cagliari, Italy)

Carlo Muscas (University of Cagliari, Italy)

Mario Paolone (Swiss Federal Institute of Technology of Lausanne (EPFL), Switzerland)

8:00 – 10:00

WA5: Mini-symposium on SI for the 21st Century

Room: Millennium 2

The Avogadro Constant and the Mole Presenter

Dr. Lindsey Mackay (National Measurement Institute, Australia)

The Planck Constant and the Kilogram

Dr. Yin Hsien Fung (Research Scientist, Mass and Related Quantities Section of MSL)

The Elementary Charge and the Ampere

Dr. Murray Early (Principle Research Scientist MSL)

The Boltzmann Constant and the Kelvin

Dr. Rod White (Distinguished Scientist, Temperature and Light Section of MSL)

10:00 - 10:30

Morning Tea

Room: Atrium/Annexe

10:30 - 11:30

Keynote Speaker: Dr. Michael de Podesta

Redefining the Kilogram, the Kelvin, the Ampere and the Mole: Why You Should Care Even Though You Won't Notice

Room: Millennium Ballroom

11:30 - 12:00

IEEE I2MTC 2019: Award Ceremony

Room: Millennium Ballroom

12:00 - 13:00

Lunch

Room: Atrium/Annexe

13:00 - 14:30

WIM Panel

Room: Coromandel

1: Optofluidic Device for Urine pH Value Measurement

Chen-Hsun Weng (National Cheng Kung University, Taiwan)

Ming-Huang Chen (National Cheng Kung University, Taiwan)

2: Optimized SSLMS algorithm with PSO for rotor vibration signal de-noising

Rongzhen Zhao (Lanzhou University of Technology, P.R. China)

Chao Li (Lanzhou University of Technology, P.R. China)

3: A study of behavioral-based model for a simple tuned oscillator

Kia Hock Tan (Universiti Tunku Abdul Rahman, Malaysia)

4: Novel Measurement Device for Local Mechatronic Property of Biological Gel with Single Mechanically Micro-Vibrating Electrode

Shigehiro Hashimoto (Kogakuin University, Japan)

Kiyoshi Yoshinaka (National Institute of Advanced Industrial Science and Technology, Japan)

5: A Novel AI Sensing and Mobile Medical Fusion System for Synchronized Blood Glucose Measurement and Insulin Injection

Jiankang Bu (University of Chicago, Endeavor Microelectronics Technology, USA)

6: Impedance Measurement by Micro-electrodes of a Pair of Concentric Cylinders for Estimation of Local Cell Configuration in Biological Tissue

Shigehiro Hashimoto (Kogakuin University, Japan)

Kiyoshi Yoshinaka (National Institute of Advanced Industrial Science and Technology, Japan)

7: Development of Multi-channel Current-Voltage Analyzer for the On-Wafer Electrical Measurement

Po-Jui Chen (Taiwan Instrument Research Institute, National Applied Research Laboratories, Taiwan)

Yi-Hao Lin (Taiwan Instrument Research Institute, National Applied Research Laboratories, Taiwan)

Yu-Hsin Lin (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)

Chih-Wen Chen (Instrument Technology Research Center, NARLabs, Taiwan)

Ming-Fu Chen (Instrument Technology Research Center, NARLabs, Taiwan)

8: Amplitude Estimation of Noisy Signal in Power System by Three-Point Interpolated DFT

Chengcheng Li (Hunan University, P.R. China)

Junwei Zhang (Guizhou Electric Power Research Institute, P.R. China)

He Wen (Hunan University & College of Electrical and Information Engineering, P.R. China)

9: Alignment and Measurement for Injection System of Medical Heavy Ion Accelerator

Wenjun Chen (Institute of Modern Physics, Chinese Academy of Sciences, P.R. China)

10: Analysis of Vibration and Acoustic Signal for Noncontact Measurement of Engine Rotate Speed

Xuansheng Shan (Hunan University, P.R. China)

Lu Tang (Hunan University, P.R. China)

He Wen (Hunan University & College of Electrical and Information Engineering, P.R. China)

11: Monitoring of Orientation of Cells by Electric Impedance: Test on Oriented Cells Using Micro Striped Pattern by Photolithography

Shigehiro Hashimoto (Kogakuin University, Japan)
Kazuyuki Abe (Kogakuin University, Japan)

12: Hybrid Multi-frequency Attitude Estimation Based on Vision and Inertial Integrated Measurement System

Yu Zhang (North University of China, P.R. China)
Xiaoting Guo (North University of China, P.R. China)
Chong Shen (North University of China, P.R. China)
Jun Tang (North University of China, P.R. China)
Jun Liu (North University of China, P.R. China)
Donghua Zhao (North University of China, P.R. China)

13: Autonomous Data Acquisition System based on a Low-Power Microcontroller and Energy Harvesting

Jorge Marcos-Acevedo (University of Vigo - E.T.S.I.I., Spain)
Camilo Quintans-Graña (University of Vigo, Spain)
Carlos Peñalver-Freire (University of Vigo, Spain)
Alfonso Lago Ferreiro (University of Vigo, Spain)
Carmen Núñez-Estévez (Universidad de Vigo, Spain)
Andrés A. Nogueiras Meléndez (University of Vigo, Spain)

13:00 – 15:00

WPS: Wednesday Poster Session

Room: Atrium/Annexe

14: Finger-vein image segmentation based on KFCM and active contour model

Jianfeng Zhang (Tianjin University, P.R. China)
Zhiying Lu (Tianjin University, P.R. China)
Min Li (Tianjin University, P.R. China)

15: Research on Technologies of Computer Aided Diagnosis for Solitary Pulmonary Nodule Based on CT Images

Yanqiu Wang (Tianjin University, P.R. China)
Yue (Tianjin University, P.R. China)
Qi Li (Tianjin University, P.R. China)
Huaxiang Wang (Tianjin University, P.R. China)
Jia Li (Tianjin University, P.R. China)

16: Superpixel-based HSI Classification via Semi-supervised K-SVD and Multi-scale Sparse Representation

Lianlei Lin (Harbin Institute of Technology, P.R. China)
Cailu Chen (Harbin Institute of Technology, P.R. China)
Zhuxu Zhou (Harbin Institute of Technology, P.R. China)
Shanshan Zhang (Harbin Institute of Technology, P.R. China)

17: A GAN-Based Anomaly Detection Method for Isoelectric Line in High-Speed Railway

Yang Lyu (Southwest Jiaotong University, P.R. China)
Zhiwei Han (Southwest Jiaotong University, P.R. China)
Junping Zhong (Southwest Jiaotong University, P.R. China)
Changjiang Li (Southwest Jiaotong University, P.R. China)
Zhigang Liu (Southwest Jiaotong University, The Netherlands)

18: Phase extraction in digital speckle pattern interferometry using variational mode decomposition and high-order ambiguity function

Qiyang Xiao (Tianjin University, P.R. China)

Jian Li (Tianjin University, P.R. China)

Hui Zhang (Tianjin University, P.R. China)

Ji Deng (Tianjin University, P.R. China)

Chang Ma (Tianjin University, P.R. China)

Hengrui Cui (Tianjin University, P.R. China)

19: Analysis of Sensitivity Matrix for Electrical Resistance Tomography

Ziqi Liu (School of Electrical and Information Engineering, Tianjin University, P.R. China)

Yanbin Xu (Tianjin University, P.R. China)

Feng Dong (Tianjin University, P.R. China)

20: A camera-based system for highly accurate 3D displacement field measurement and contactless force sensing

Amir HajiRassouliha (University of Auckland, New Zealand)

Andrew Taberner (University of Auckland, New Zealand)

Debbie Zhao (University of Auckland, New Zealand)

Martyn Nash (The University of Auckland, New Zealand)

Poul F Nielsen (University of Auckland, New Zealand)

Emily Lam Po Tang (University of Auckland, New Zealand)

21: Accurate Shoulder Joint Angle Estimation Using Single RGB Camera For Rehabilitation

Kushsairy Kadir (Universiti Kuala Lumpur British Malaysian Institute, Malaysia)

Sheroz Khan (Ineternational Islamic University Malaysia, Malaysia)

Muhammad Yahya (Universiti Kula Lumpur, Malaysia)

Haidawati Nasir (Universiti Kuala Lumpur, Malaysia)

Jawad Shah (UniKL, Malaysia)

22: Analysis of horizontal slug translational velocity based on the image processing technique

Ting Xue (Tianjin University, P.R. China)

Qian Wang (University of Tianjin, P.R. China)

Chenyang Li (College of Electrical and Information Engineering, P.R. China)

23: On The Data Conditioning For Facial Spoofing Attacks Detection Using Deep Learning

Jacob Scharcanski (UFRGS, Brazil)

Lucas R Schardosim (Federal University of Rio Grande do Sul, Brazil)

Raphael Ruschel (UFRGS, Brazil)

24: Aviation Plug On-site Measurement and Fault Detection Method Based on Model Matching

Miao Zhang (Harbin Institute of Technology, P.R. China)

Yifan Lu (Harbin Institute of Technology & Control Science and Engineering, P.R. China)

Xinxin Li (Harbin Institute of Technology & Control Science and Engineering, P.R. China)

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

Qiang Wang (Harbin Institute of Technology, P.R. China)

Dandan Li (Harbin Institute of Technology & None, P.R. China)

Yu Jiang (Harbin Institute of Technology, P.R. China)

25: Measurement of Displacement in Isolated Heart Muscle Cells using Markerless Subpixel Image Registration

Emily Lam Po Tang (University of Auckland, New Zealand)
Robin Laven (Auckland Bioengineering Institute, University of Auckland, New Zealand)
Amir HajiRassouliha (University of Auckland, New Zealand)
Poul F Nielsen (University of Auckland, New Zealand)
Andrew Taberner (University of Auckland, New Zealand)

26: A Method for Three-Dimensional Measurements Using Widely Angled Stereoscopic Cameras

Amir HajiRassouliha (University of Auckland, New Zealand)
Emily Lam Po Tang (University of Auckland, New Zealand)
Andrew Taberner (University of Auckland, New Zealand)
Marty Nash (The University of Auckland, New Zealand)
Poul F Nielsen (University of Auckland, New Zealand)

27: Monitoring the Ratio Error Drift of CVTs Connected to the Same Phase along with KDE-PCA

Chuanji Zhang (Huazhong University of Science and Technology, P.R. China)
Zhan Meng (Huazhong University of Science and Technology, P.R. China)
Mianzhou Chen (Huazhong University of Science and Technology, P.R. China)
Yang Jiao (Huazhong University of Science and Technology, P.R. China)
Qing Chen (Huazhong University of Science and Technology, P.R. China)
Hongbin Li (Huazhong University of Science and Technology, P.R. China)

A Simple Time-Domain Algorithm for Synchrophasor, Frequency and ROCOF Estimation

David Macii (University of Trento, Italy)
Dario Petri (University of Trento, Italy)

29: A Monitoring and Management System for Energy Storage Integration in Smart Grids

Giovanni Artale (Università di Palermo, Italy)
Giuseppe Caravello (University of Palermo, Italy)
Antonio Cataliotti (University of Palermo, Italy)
Valentina Cosentino (University of Palermo, Italy)
Salvatore Guaiana (Università di Palermo, Italy)
Dario Di Cara (National Research Council, Italy)
Nicola Panzavecchia (National Research Council, Italy)
Giovanni Tinè (National Research Council, Italy)
Vincenzo Antonucci (National Council of Research (CNR) Nicola Giordano (ITAE), Italy)
Marco Ferraro (National Council of Research (CNR) Nicola Giordano (ITAE), Italy)
Francesco Sergi (National Council of Research (CNR) Nicola Giordano (ITAE), Italy)

30: Phantom Power Generator for DC Railway Metrology

Davide Signorino (Istituto Nazionale di Ricerca Metrologica (INRIM), Italy)
Gabriella Crotti (Istituto Nazionale di Ricerca Metrologica, Italy)
Antonio Delle Femine (University of Campania Luigi Vanvitelli, Italy)
Daniele Gallo (University of Campania Luigi Vanvitelli, Italy)
Domenico Giordano (Istituto Nazionale di Ricerca Metrologica, Italy)
Carmine Landi (University of Campania Luigi Vanvitelli, Italy)
Mario Luiso (University of Campania Luigi Vanvitelli, Italy)

31: Uncertainty Analysis of Distribution System State Estimation based on Extended Kalman Filtering and Phasor Measurement Units

David Macii (University of Trento, Italy)

Zohaib Aziz (University of Trento, Italy)

Daniele Fontanelli (University of Trento, Italy)

32: Calculating the Output Power of Photovoltaic Cells on Top of Electric and Hybrid Electric Vehicles

Christian Schuss (University of Oulu & Faculty of Information Technology and Electrical Engineering, Finland)

Tapio Fabritius (University of Oulu, Finland)

Bernd Eichberger (Graz University of Technology, Austria)

Timo Rahkonen (University of Oulu, Finland)

33: Low Cost Procedure for Frequency Characterization of Voltage Instrument Transformers

Palma Sara Letizia (INRiM-Istituto Nazionale di Ricerca Metrologica & Politecnico di Torino, Italy)

Gabriella Crotti (Istituto Nazionale di Ricerca Metrologia, Italy)

Antonio Delle Femine (University of Campania Luigi Vanvitelli, Italy)

Daniele Gallo (University of Campania Luigi Vanvitelli, Italy)

Domenico Giordano (Istituto Nazionale di Ricerca Metrologica, Italy)

Carmine Landi (University of Campania Luigi Vanvitelli, Italy)

Mario Luiso (University of Campania Luigi Vanvitelli, Italy)

34: Beam-based alignment of the CLIC high-gradient X-Band accelerating structure using beam screen

Antonio Gilardi (University of Napoli - Federico II & CERN, Italy)

Pasquale Arpaia (University of Naples Federico II, Italy)

Kyrre Sjoebaek (University of Oslo - CERN, Switzerland)

Roberto Corsini (CERN, Switzerland)

36: Image matching algorithm for weed control applications in organic farming

Stephan Hussmann (West Coast University of Applied Sciences, Germany)

Florian Johannes Knoll (West Coast University, Germany)

Vitali Czymmek (West Coast University of Applied Sciences, Germany)

Yuheng Wang (West Coast University of Applied Sciences, Germany)

37: Methodology of extracting microtopography of kiwifruit skin using fringe projection

Po-Han (Leo) Lai (Massey University, New Zealand)

Donald G. Bailey (Massey University & School of Food and Advanced Technology, New Zealand)

Andrew East (Massey University, New Zealand)

Sunny-George Gwanpua (Massey University, New Zealand)

Julian Heyes (Massey University, New Zealand)

38: A Simplified Linearizer for TMR Angle Sensor - Design and Performance Verification

Kishor Bhaskarrao Nandapurkar (Indian Institute of Technology Kharagpur, India)

Chandrika Sreekantan Anoop (Indian Institute of Space Science and Technology, India)

Pranab K. Dutta (IIT Kharagpur, India)

39: State of Charge Estimation for Li-Ion Batteries Based on Recurrent NARX Neural Network with Temperature Effect

Jonathan Moura (Universidade Federal da Paraíba, Brazil)
Juan Moises Mauricio Villanueva (Federal University of Paraiba & UFPB, Brazil)
Rafael Medeiros (Federal University of Paraiba, Brazil)
Kaique de Azevedo Albuquerque (Universidade Federal da Paraíba, Brazil)
Sebastian Yuri Cavalcanti Catunda (Federal University of Rio Grande do Norte, Brazil)

40: IMU self-alignment in suspensions control system

Salvatore Dello Iacono (University of Salerno, Italy)
Marco Carratu' (University of Salerno, Italy)
Antonio Pietrosanto (University of Salerno & CEO of SPRING OFF srl, Italy)
Vincenzo Paciello (University of Cassino and Southern Lazio, Italy)

41: An Automatic Emulation System for Environmental Thermal Energy Harvesting

Cleonilson Protasio de Souza (Federal University of Paraiba, Brazil)
Marcelo Camboin (Federal University of Paraiba, Brazil)
Andréa Villarim (Universidade Federal da Paraíba, Brazil)
Orlando Baiocchi (University of Washington, USA)
Cleumar da Silva Moreira (Instituto Federal da Paraíba & Campus Joao Pessoa, Brazil)
Sebastian Yuri Cavalcanti Catunda (Federal University of Rio Grande do Norte, Brazil)

42: Measurement and Evaluation Method based on Under-sampling of High-Frequency Wide-Band Radio Signal

Shouta Kanno (Nihon University, Japan)
Takeshi Imai (Nihon University, Japan)
Akihito Otani (Nihon University, Japan)

43: Waveguide Joint Design and Validation for use in Acoustic Vector-corrected Network Analysers

Marcus MacDonell (University of Waikato, New Zealand)
Jonathan Scott (The University of Waikato, New Zealand)
Keshav Basnet (University of Waikato, New Zealand)

44: Evaluation of A Novel Ultra-Low Energy Real-Time SmartMAC Protocol

Axel Sikora (University of Applied Sciences Offenburg, Germany)
Manuel Schappacher (Offenburg University of Applied Sciences, Germany)
Voicu Groza (University of Ottawa, Canada)

45: Research on LoRa Communication Performance in Manhole Cover Monitoring

Xuan Liu (Beijing Jiaotong University, P.R. China)
Hesheng Zhang (Beijing Jiaotong University, P.R. China)

46: Artificial Intelligence-Based Distributed Network Latency Measurement

Shady Mohammed (University of Ottawa, Canada)
Shervin Shirmohammadi (University of Ottawa, Canada)
Sa'di Altamimi (University of Ottawa, Canada)

47: Data Acquisition System Development for a Hydraulic Plant using Hybrid Communication Network based on LoRa

Emmanuel de Medeiros (University Federal of Paraíba, Brazil)
Carlos Sousa-Filho (UFPB, Brazil)
Fabricio Braga Soares de Carvalho (Federal University of Paraiba - UFPB, Brazil)
Rossana Moreno Santa Cruz (Instituto Federal da Paraíba, Brazil)
Cleumar da Silva Moreira (Instituto Federal da Paraíba & Campus Joao Pessoa, Brazil)

48: Wearable Koch Pre-Fractal Antennas for Ultrahigh Frequency Band

Arianne Evangelista (Universidade Estadual do Maranhão, Brazil)
Paulo Fernandes da Silva Júnior (Universidade Estadual do Maranhão, Brazil)
Ewaldo Santana (University of State of Maranhao, Brazil)
Mauro Silva Pinto (Federal University of Maranhão, Brazil)
Raimundo Freire (Universidade Federal de Campina Grande - PB, Brazil)
Maciel Oliveira (UFCEG, Brazil)
Paulo Silva (Federal Institute of Education, Science and Technology of Paraíba, Brazil)
Alexandre Serres (UFCEG, Brazil)
Jalberth Araújo (Universidade Federal de Campina Grande, Brazil)

49: Metal Surface Defect Detection System Based on Semiconductor Laser and Infrared Thermal Imaging

Zhijie Zhang (North University of China, P.R. China)
Ningchen Dong (North University of China, P.R. China)
Wuliang Yin (The University of Manchester, United Kingdom (Great Britain))
Chenyang Zhao (North University of China & School of Instrument and Electronics, P.R. China)

50: Wideband Circular Microwave Imaging Array Embedded into Metallic Cylinder

Mohamed A Abou-Khousa (Khalifa University of Science and Technology & Petroleum Institute, United Arab Emirates)

51: Fast wavelength modulated TDLAS imaging system for flame monitoring

Ang Huang (Beihang University, P.R. China)
Zhang Cao (Beihang University, P.R. China)
Wenshuai Zhao (Beihang University, P.R. China)
Hongyu Zhang (Beihang University, P.R. China)
Lijun Xu (Beihang University, P.R. China)

52: Auto-focus pathology microscope using sub-array sampling

Po-Hsun Wu (National Chiao Tung University, Taiwan)
Chun-Jen Weng (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Pi-Ying Cheng (National Chiao Tung University, Taiwan)

53: Development of a Surface-Plasmon Resonance Sensor Testbed for Bimetallic Sensors

Roshni Babu (Victoria University of Wellington, New Zealand)
Hamish Colenso (Victoria University of Wellington, New Zealand)
Gideon Gouws (Victoria University of Wellington, New Zealand)
Baptiste Auguié (Victoria University of Wellington, New Zealand)
Ciaran Moore (Victoria University of Wellington, New Zealand)

54: Optical Blade Tip-timing System Based on the Micro-structured Surface Using Phase Demodulation Algorithm

Jianzhong Zhang (Harbin Engineering University, P.R. China)
Yang Luo (Harbin Engineering University, P.R. China)
Quan Chai (Harbin Engineering University, P.R. China)
Qu Ruixuan (Harbin Engineering University, P.R. China)

55: FBG Smart Bolts and its Application in Power Grid

Hongying Zhang (Harbin Engineering University, P.R. China)
Chao Duan (Harbin Engineering University, P.R. China)
Zhuoshu Li (Harbin Engineering University, P.R. China)
Ye Tian (Harbin Engineering University, P.R. China)
Quan Chai (Harbin Engineering University, P.R. China)
Jianzhong Zhang (Harbin Engineering University, P.R. China)

56: Label-free Detection of Breast Cancer Cells Using a Fiber-optic Grating Sensor Functionalized with Halloysite Nanotubes

Xia Chen (Jinan University, P.R. China)

57: Polarization Control for Dual Mach-Zehnder Fiber Vibration Sensor Using Simulated Annealing

Zhou Sha (Tianjin University, P.R. China)
Hao Feng (Tianjin University, P.R. China)
Yi Shi (Tianjin University, P.R. China)
Zhoumo Zeng (Tianjin University, P.R. China)

58: Theoretical Analysis and Proposition of an Enhanced Surface Plasmon Resonance Based Optical Fiber Tip Sensor with Graphene Overlay

Arthur Aprício de Melo (Federal Institute of Education, Science and Technology of Paraíba (IFPB), Brazil)
Talita Silva (Instituto Federal da Paraíba, Brazil)
Cleumar da Silva Moreira (Instituto Federal da Paraíba & Campus Joao Pessoa, Brazil)
Rossana Moreno Santa Cruz (Instituto Federal da Paraíba, Brazil)

59: Computational analysis of nanoparticles for the construction of nanosensors based on localized surface plasmon resonance"

Talita Silva (Instituto Federal da Paraíba, Brazil)
Arthur Aprício de Melo (Federal Institute of Education, Science and Technology of Paraíba (IFPB), Brazil)
Cleumar da Silva Moreira (Instituto Federal da Paraíba & Campus Joao Pessoa, Brazil)
Rossana Moreno Santa Cruz (Instituto Federal da Paraíba, Brazil)

60: A Deformation Sensor based upon Light Attenuation in a Silicone Waveguide: Construction and Characterisation

Alistair Newcombe (University of Auckland & Auckland Bioengineering Institute, New Zealand)
Hayden Randles (University of Auckland, New Zealand)
David Dudgett (University of Auckland, New Zealand)
Andrew Taberner (University of Auckland, New Zealand)
Poul F Nielsen (University of Auckland, New Zealand)

61: MuSLoc: Circular Array Based Indoor Localization with COTS APs

Kawser Wazed Nafi (University of Ottawa, Canada)
Wei Gong (University of Science and Technology of China, P.R. China)
Amiya Nayak (SITE, University of Ottawa, Canada)

62: Design of a Soft Sensor for an Industrial Plant with Unknown Delay by Using Deep Learning

Salvatore Graziani (University of Catania, Italy)
Maria Gabriella Xibilia (University of Messina, Italy)

63: Analysis of Autoregressive Coefficients of Knock Sensor Signals for Misfire Detection in Internal Combustion Engines

Matthias Rath (Graz University of Technology, Austria)
Riccardo Basso (Graz University of Technology, Austria)
Hannes Wegleiter (Graz University of Technology, Austria)
Georg Brasseur (Graz University of Technology, Austria)

13:00 – 15:00

SMSC: IEEE International Sensors and Measurement Student Contest

Room: Aucklander

15:00 - 15:30

Afternoon Tea

Room: Atrium/Annexe

15:30 – 17:30

WP1: Special Session 13: Recent Advances in Fiber Optic Sensing: Sensors, Instrumentation, Measurements and Applications

Room: Tasman 1

Fiber optic photodynamic manipulating tools

Prof. Libo Yuan (Guilin University of Electronic Technology, China)

High-Spatial Resolution Demodulation of Weak FBGs Based on Incoherent Optical Frequency Domain Reflectometry Using a Chaotic laser

Qian Yang (Wuhan University of Technology, P.R. China)
Xuelei Fu (Wuhan University of Technology, P.R. China)
Honghai Wang (Wuhan University of Technology, P.R. China)
Quan Liu (Wuhan University of Technology, P.R. China)
Gangao Yan (Wuhan University of Technology, P.R. China)
Zhengying Li (Wuhan University of Technology, P.R. China)

Research and Implementation of Super High-Speed Fiber Bragg Grating Demodulator

Yarong Hou (Wuhan University of Technology, P.R. China)
Yiming Wang (Wuhan University of Technology, P.R. China)
Honghai Wang (Wuhan University of Technology, P.R. China)
Quan Liu (Wuhan University of Technology, P.R. China)
Linfeng Li (Wuhan University of Technology, P.R. China)
Zhengying Li (Wuhan University of Technology, P.R. China)

Simultaneous detection of deepsea earthquake and magnetic field using three-axis fiber optic accelerometer-magnetometer

Wentao Zhang (Institute of Semiconductors, Chinese Academy of Sciences, P.R. China)
Wenzhu Huang (Institute of Semiconductors, Chinese Academy of Sciences, P.R. China)
Fang Li (Institute of Semiconductors, Chinese Academy of Sciences, P.R. China)
Yingbo Luo (Institute of Semiconductors, Chinese Academy of Sciences, P.R. China)

Monitoring of buoyancy material curing based on FBG sensors

Wentao Zhang (Institute of Semiconductors, Chinese Academy of Sciences, P.R. China)
Shuaijie Miao (Institute of Semiconductors, Chinese Academy of Sciences, P.R. China)
Wenzhu Huang (Institute of Semiconductors, Chinese Academy of Sciences, P.R. China)
Fang Li (Institute of Semiconductors, Chinese Academy of Sciences, P.R. China)
Ying Song (Shijiazhuang Tiedao University, P.R. China)

Thin-film Thickness Absolute Measurement by Differential Optic-fiber White Light Interferometry

Xu Lu (Harbin Engineering University, P.R. China)
Zhangjun Yu (Harbin Engineering University, P.R. China)
Jun Yang (Harbin Engineering University, P.R. China)
Yonggui Yuan (Harbin Engineering University, P.R. China)
Hanyang Li (Harbin Engineering University, P.R. China)
Libo Yuan (Harbin Engineering University, P.R. China)

15:30 – 17:30

WP2: Networks and measurements - 1

Room: Tasman 2

Wireline channel estimation by compressive sampling for physical layer testing

Luca De Vito (University of Sannio, Italy)
Francesco Picariello (University of Sannio, Italy)
Sergio Rapuano (University of Sannio, Italy)
Ioan Tudosa (University of Sannio, Italy)
Lee A Barford (Keysight Laboratories, Keysight Technologies, Inc. & University of Nevada, USA)

Evaluation of the Performance of a Wireless Mesh Network Built with Sub-GHz Transceivers

Kaique de Azevedo Albuquerque (Universidade Federal da Paraíba, Brazil)
Rafael Medeiros (Federal University of Paraíba, Brazil)
Celso Padilha (Federal University of Paraíba, Brazil)
Jose Custodio (Federal University of Paraíba - UFPB, Brazil)
Juan Moises Mauricio Villanueva (Federal University of Paraíba & UFPB, Brazil)
Euler Tavares Macedo (Federal University of Paraíba, Brazil)
Jonathan Moura (Universidade Federal da Paraíba, Brazil)
Sebastian Yuri Cavalcanti Catunda (Federal University of Rio Grande do Norte, Brazil)

Development of low power consumption manhole cover monitoring device using LoRa

Lei Li (Beijing Jiaotong University, P.R. China)
Hesheng Zhang (Beijing Jiaotong University, P.R. China)

Cell Capacity Evaluation of Downlink 2x2 and 4x4 MIMO with Respect to 2R and 4R CPEs

Jianquan Liang (Huawei Technologies New Zealand, New Zealand)
Shudong Fang (The University of Auckland, New Zealand)

Smart meters communication using Gas pipelines as channel: feasibility study

Francesco Abate (University of Salerno, Italy)
Domenico Di Caro (University of Salerno, Italy)
Giuseppe Di Leo (University of Salerno, Italy)
Vincenzo Paciello (University of Cassino and Southern Lazio, Italy)
Antonio Pietrosanto (University of Salerno & CEO of SPRING OFF srl, Italy)

Distributed Sampling of Multiple Sinusoids with Finite Rate of Innovation

Zhiliang Wei (Harbin Institute of Technology, P.R. China)
Ning Fu (Harbin Institute of Technology, P.R. China)
Liyao Qiao (Harbin Institute of Technology, P.R. China)

Experimental investigation on acoustic characteristics of small leakages in metal water pipe for in-pipe inspections

Tianshu Xu (Tianjin University, P.R. China)
Zhoumo Zeng (Tianjin University, P.R. China)
Xinjing Huang (Tianjin University, P.R. China)
Jian Li (Tianjin University, P.R. China)
Shili Chen (Tianjin University, P.R. China)
Xiaobo Rui (Tianjin University, P.R. China)

Excitation structure design and magnetic field analysis of a new electromagnetic flowmeter based on magnetically permeable material

Hongyu Yang (University of Electronic Science and Technology of China & School of Automation Engineering, P.R. China)
Yan Chen (University of Electronic Science and Technology of China, P.R. China)
Guangming Qing (China Railway Rolling Stock Corporation ZhuZhou Institute Co., Ltd, P.R. China)
Hui Zhao (University of Electronic Science and Technology of China, P.R. China)

A fast baseline and trigger level calibration method in digital oscilloscope

Kuojun Yang (University of Electronic Science and Technology of China, P.R. China)
Zhixiang Pan (University of Electronic Science and Technology of China, P.R. China)
Jiali Shi (SiChuan College of Architectural Technology, P.R. China)
Peng Ye (University of Electronic Science and Technology of China, P.R. China)

An algorithm for Implementing Large-point DFT

Yijiao Zhang (University of Electronic Science and Technology of China, P.R. China)
Shulin Tian (University of Electronic Science and Technology of China, P.R. China)
Huiqing Pan (University of Electronic Science and Technology of China, P.R. China)
Lianping Guo (University of Electronic Science and Technology of China, P.R. China)
Kuojun Yang (University of Electronic Science and Technology of China, P.R. China)

Quantification of complex defects in magnetic flux leakage (MFL) testing using gradient gray level analysis based on least square approximation

Libing Bai (University of Electronic Science and Technology of China, P.R. China)
Yuhua Cheng (University of Electronic Science and Technology of China & School of Automation Engineering, P.R. China)
Fred John Alimey (University of Electronic Science and Technology of China (UESTC), P.R. China)
Haichao Yu (University of Electronic Science and Technology of China, P.R. China)
Jinhua Mi (University of Electronic Science and Technology of China, P.R. China)
Yonggang Wang (University of Electronic Science and Technology of China, P.R. China)

Lithium-ion battery state of health monitoring based on ensemble learning

Yuanyuan Li (University of Electronic Science and Technology of China, P.R. China)
Hanmin Sheng (University of Electronic Science and Technology of China, P.R. China)
Yuhua Cheng (University of Electronic Science and Technology of China & School of Automation Engineering, P.R. China)
Hongjun Kuang (University of Electronic Science and Technology of China, P.R. China)

15:30 – 17:30

WP4: Energy and Power - 3

Room: Millennium 1

Experimenting Non-Contact Power Measurement for 3-Phase Residential Applications

Ferdinanda Ponci (RWTH Aachen University, Germany)

Carlo Guarnieri Calò Carducci (RWTH Aachen University, Germany)

Antonello Monti (RWTH Aachen University & Institute for Automation of Complex Power Systems, Germany)

A Design Approach for a Low Cost Phasor Measurement Unit

Antonio Delle Femine (University of Campania Luigi Vanvitelli, Italy)

Daniele Gallo (University of Campania Luigi Vanvitelli, Italy)

Carmine Landi (University of Campania Luigi Vanvitelli, Italy)

Mario Luiso (University of Campania Luigi Vanvitelli, Italy)

A Space Vector Phase-Locked-Loop approach to synchrophasor, frequency and ROCOF estimation

Roberto Ferrero (University of Liverpool, United Kingdom (Great Britain))

Paolo Attilio Pegoraro (University of Cagliari, Italy)

Sergio Toscani (Politecnico di Milano, Italy)

A Review on the Application of the Time Reversal Theory to Wire Network and Power System Diagnosis

Moussa Kafal (CEA, LIST, France)

Reza Razzaghi (Monash University, Australia)

Andrea Cozza (CentraleSupélec - CNRS - Université Paris Sud & GeePs Laboratory, France)

Fabrice Auzanneau (CEA LIST, France)

Wafa Ben Hassen (CEA LIST, France)

Measurement of transient flow structures of horizontal gas-liquid two-phase flows using wire-mesh sensor

Lusheng Zhai (Tianjin University, P.R. China)

Jie Yang (Tianjin University, P.R. China)

Hailin Xie (Tianjin University, P.R. China)

Ziqiang Cui (Tianjin University, P.R. China)

Moving Photovoltaic (PV) Installations: Impacts of the Solar Radiation Level on the Output Power

Christian Schuss (University of Oulu & Faculty of Information Technology and Electrical Engineering, Finland)

Tapio Fabritius (University of Oulu, Finland)

Bernd Eichberger (Graz University of Technology, Austria)

Timo Rahkonen (University of Oulu, Finland)

15:30 – 17:30

WP5: Student/YP Panel

Room: Millennium 2

17:30 - 22:30

Gala Dinner: Auckland War Memorial Museum

Technical Schedule: Thursday, May 23

7:00 - 17:30

Registration

8:00 – 10:00

HA1: Robotics

Room: Tasman 1

Performance Assessment of a People Tracker for Social Robots

Alessandro Antonucci (University of Trento, Italy)

Valerio Magnago (University of Trento, Italy)

Luigi Palopoli (Università di Trento, Italy)

Daniele Fontanelli (University of Trento, Italy)

Analysis of Measurement Process Design for a Dual-Arm Robot Using Graphical User Interface

Shalaka Joshi (University of Rostock, Germany)

Heidi Fleischer (University of Rostock, Germany)

Thomas Roddelkopf (Center for Life Science Automation - CELISCA, Germany)

Michael Klos (Yaskawa Europe GmbH, Germany)

Kerstin Thurow (Center for Life Science Automation - CELISCA, Germany)

Robot Localisation based on Phase Measures of backscattered UHF-RFID Signals

Valerio Magnago (University of Trento, Italy)

Luigi Palopoli (Università di Trento, Italy)

Daniele Fontanelli (University of Trento, Italy)

David Macii (University of Trento, Italy)

Andrea Motroni (University of Pisa, Italy)

Paolo Nepa (University of Pisa, Italy)

Alice Buffi (University of Pisa, Italy)

Bernardo Tellini (University of Pisa, Italy)

Constrained Kalman Filter for Adaptive Prediction in Minidrone Flight

Marco Andreetto (University of Trento, Italy)

Luigi Palopoli (Università di Trento, Italy)

Daniele Fontanelli (University of Trento, Italy)

Development and evaluation of a low-cost delta robot system for weed control applications in organic farming

Stephan Hussmann (West Coast University of Applied Sciences, Germany)

Tim Holtorf (West Coast University of Applied Sciences, Germany)

Florian Johannes Knoll (West Coast University, Germany)

Vitali Czymmek (West Coast University of Applied Sciences, Germany)

André Meissner (West Coast University of Applied Sciences, Germany)

A Novel Underactuated Soft Humanoid Hand For Hand Sign Language

Mohamed Salem (Harbin Institute of Technology & Benha Faculty Of Engineering, P.R. China)

Ruoshi Wen (Harbin Institute of Technology, P.R. China)

Ma Xu (Harbin Institute of Technology, P.R. China)

Yan Liu (Harbin University of science and Technology)

Xiang Ma (Harbin Institute of Technology, P.R. China)

Qiang Wang (Harbin Institute of Technology, P.R. China)

8:00 – 10:00

HA2: Non-invasive Measurements - 1

Room: Tasman 2

A cost-effective method to assess the fiber content and orientation in steel fiber reinforced concrete

Ting Lei (Politecnico di Milano, Italy)

Marco Faifer (Politecnico di Milano, Italy)

Liberato Ferrara (Politecnico di Milano, Italy)

Roberto Ottoboni (Politecnico di Milano, Italy)

Sergio Toscani (Politecnico di Milano, Italy)

A Method for Absolute Electrical Impedance Tomography without Measuring Reference Voltages

Zeying Wang (Tianjin University, P.R. China)

Yue (Tianjin University, P.R. China)

Xiaoyuan Liu (Tianjin University, P.R. China)

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

Huaxiang Wang (Tianjin University, P.R. China)

Research on Low Water Volume Fraction Measurement of Two-Phase Flow Based on TM010 Mode Microwave Cavity Sensor

Yi-Guang Yang (Tianjin University, P.R. China)

Ying Xu (Tianjin University, P.R. China)

Tao Zhang (TianJin University, P.R. China)

On the Inspection of Glass Reinforced Epoxy Pipes using Microwave NDT

Mohammed Saif ur Rahman (Khalifa University-The Petroleum Institute, United Arab Emirates)

Andri Haryono (Khalifa University of Science and Technology, United Arab Emirates)

Zubair Akhter (Khalifa University of Science and Technology, Abu Dhabi, United Arab Emirates)

Mohamed A Abou-Khousa (Khalifa University of Science and Technology & Petroleum Institute, United Arab Emirates)

Excitation Patterns in 3D Electrical Impedance Tomography for Breast Imaging

Shijie Sun (Beihang University, P.R. China)

Lijun Xu (Beihang University, P.R. China)

Zhang Cao (Beihang University, P.R. China)

Jiangtao Sun (Beihang University, P.R. China)

Wenbin Tian (Beihang University, P.R. China)

Duan Li (Beihang University, P.R. China)

Bearing fault diagnosis under different operating conditions based on cross domain feature projection and domain adaptation

Shuzhi Dong (Xi'anJiaotong University, P.R. China)

Guangrui Wen (Xi'anJiaotong University, P.R. China)

Zhifen Zhang (Xi'an Jiaotong University, P.R. China)

8:00 - 10:00

HA3: Sensors and Transducers - 1

Room: Aucklander

Design of Accurate Rogowski Coil for High Transient Currents

Mirko Marracci (University of Pisa, Italy)

Bernardo Tellini (University of Pisa, Italy)

Dynamic Spatial Measurements based on a Bimorph Artificial Whisker and RTD-Fluxgate Magnetometer

Carlo Trigona (University of Catania, Italy)
Valentina Sinatra (University of Catania, Italy)
Salvatore Puglisi (University of Catania, Italy)
Antonio Riccardo Fallico (University of Catania, Italy)
Bruno Andò (University of Catania, Italy)
Salvatore Baglio (University of Catania, Italy)

Differential Inductive Sensor-to-Microcontroller Interface Circuit

Zhivko Kokolanski (Assistant, Macedonia, the former Yugoslav Republic of)
Manel Gasulla (Universitat Politècnica de Catalunya, Spain)
Ferran Reverter (Universitat Politècnica de Catalunya, Spain)

Low-Cost Eye Gesture Communication System for People with Motor Disabilities

Moi Tin Chew (Massey University, New Zealand)

Impact of Data Model on Performance of Time Series Database for Internet of Things Applications

Stefano Rinaldi (University of Brescia, Italy)
Federico Bonafini (University of Brescia, Italy)
Paolo Ferrari (University of Brescia, Italy)
Alessandra Flammini (University of Brescia, Italy)
Emiliano Sisinni (University of Brescia, Italy)
Devis Bianchini (University of Brescia, Italy)

Signal analysis of vortex flow field in mist flow using transient pressure sensor array

Hongjun Sun (Tianjin University, P.R. China)
Xiaoliang Li (Tianjin University, P.R. China)
Hongbing Ding (Tianjin University, P.R. China)
Jinxia Li (Tianjin University, P.R. China)

8:00 – 10:00

HA4: Signal Processing - 1

Room: Millennium 1

Accurate measurement of Kinetic Friction Coefficient by using two types of tribometer

Domenico Russo (University of Salerno, Italy)
Giuseppe Di Leo (University of Salerno, Italy)
Consolatina Liguori (University of Salerno, Italy)
Alessandro Ruggiero (University of Salerno, Italy)
Paolo Sommella (University of Salerno, Italy)

Amplitude and phase estimations in the shortened measurement time using average values of signal

Dušan Agrež (University of Ljubljana, Slovenia)

Accuracy Analysis of an Enhanced Frequency-Domain Linear Least-Squares Algorithm

Daniel Belega (University of Timisoara, Romania)
Dario Petri (University of Trento, Italy)

Localization of radio emitters by wideband compressive sampling

Eulalia Balestrieri (University of Sannio, Italy)
Luca De Vito (University of Sannio, Italy)
Francesco Picariello (University of Sannio, Italy)
Ioan Tudosa (University of Sannio, Italy)

Best Linear Approximation revisited: Random Gain Approach

Kurt Barbé (Vrije Universiteit Brussel & Faculty of Sciences, Belgium)

Choosing number of basis functions in weighted least-squares method for fusion of measurement data used for persons' monitoring

Paweł Mazurek (Warsaw University of Technology, Poland)
Jakub Wagner (Warsaw University of Technology, Poland)
Roman Morawski (Warsaw University of Technology, Poland)

8:00 – 10:00

HA5: Measurement for Medical, Biomedical and Healthcare - 1

Room: Millennium 2

Amplitude Modulation Method for Acoustic Radiation Force Impulse Excitation

Xuyang Bao (School of Electrical and Information Engineering, Tianjin University, P.R. China)
Yanbin Xu (Tianjin University, P.R. China)
Shengnan Zhang (Tianjin University, P.R. China)
Dongdong Zheng (School of Electrical and Information Engineering, Tianjin University, P.R. China)
Feng Dong (Tianjin University, P.R. China)

Detection of Heart Murmurs for Imbalanced Dataset Using Adaptive Synthetic Sampling Approach

Madhusudhan Mishra (Indian Institute of Technology, Kharagpur & NERIST, India)
Anirban Mukherjee (Indian Institute of Technology Kharagpur, India)

Development of a Wirelessly-Powered Wearable System for Finger Tracking

Alessio De Angelis (University of Perugia, Italy)
Marco Dionigi (University of Perugia, Italy)
Antonio Moschitta (University of Perugia, Italy)
Paolo Carbone (University of Perugia, Italy)
Paolo Bellitti (Università degli Studi di Brescia, Italy)
Mauro Serpelloni (University of Brescia, Italy)
Emilio Sardini (University of Brescia, Italy)

A measurement strategy to assess performances of Fall Detector paradigms

Ruben Crispino (DIEEI-University of Catania, Italy)
Bruno Andò (University of Catania, Italy)
Vincenzo Marletta (University of Catania, Italy)
Salvatore Baglio (University of Catania, Italy)

Developments in non-contact eye tonometer calibration

Peter Pavlasek (Slovak University of Technology & Slovak Institute of Metrology, Slovakia)
Jan Rybar (Slovak University of Technology, Slovakia)
Stanislav Duris (Slovak University of Technology, Slovakia)
Branislav Hucko (Slovak University of Technology, Slovakia)
Jakub Palencar (Slovak University of Technology, Slovakia)
Miroslav Chytil (Slovak Institute of Metrology, Slovakia)

Metrological performance of a single-channel Brain-Computer Interface based on Motor Imagery

Leopoldo Angrisani (University of Naples Federico II, Italy)
Pasquale Arpaia (University of Naples Federico II, Italy)
Francesco Donnarumma (National Research Council, Italy)
Antonio Esposito (Politecnico di Torino & Instrumentation and Measurement for Particle Accelerators Lab (IMPALab), Italy)
Nicola Moccaldi (University of Naples Federico II, Italy)
Marco Parvis (Politecnico di Torino, Italy)

10:00 - 10:30

Morning Tea

Room: Atrium/Annexe

10:30 - 11:30

Keynote Speaker: Prof. Cather Simpson

Photonics Transforming 21 st Century Sensing

Room: Millennium Ballroom

11:30 - 12:00

I2MTC 2020: Presentations

Room: Millennium Ballroom

12:00 - 13:00

Lunch

Room: Atrium/Annexe

13:00 – 15:00

HP1: Industry 4.0 - 1

Room: Tasman 1

Flexible Electronics Non-Destructive Uniformity Characterization by Synchronized Thermography

Kari Remes (University of Oulu, Finland)
Antti Latomäki (University of Oulu, Finland)
Tapio Fabritius (University of Oulu, Finland)

In-situ Quality Monitoring of Amine in Natural Gas Sweetening Units Using UHF Probe

Zubair Akhter (Khalifa University of Science and Technology, Abu Dhabi, United Arab Emirates)
Mohamed A Abou-Khousa (Khalifa University of Science and Technology & Petroleum Institute, United Arab Emirates)
Fawzi Banat (Khalifa University of Science and Technology, Abu Dhabi, United Arab Emirates)

Operation Status Tracking for Legacy Manufacturing Systems via Vibration Analysis

Boon Yaik Ooi (UTAR, Malaysia)
Woan Lin Beh (Universiti Tunku Abdul Rahman, Malaysia)
Wai Kong Lee (Universiti Tunku Abdul Rahman, Malaysia)
Shervin Shirmohammadi (University of Ottawa, Canada)

A TDR-Based Method for Pre-bond Testing of the Silicon Interposer in 2.5D ICs

Deng Libao (Harbin Institute of Technology at Weihai, P.R. China)
Ning Sun (Harbin Institute of Technology, P.R. China)
Ning Fu (Harbin Institute of Technology, P.R. China)
Liyang Qiao (Harbin Institute of Technology, P.R. China)

Friction torque study on double-row tapered roller bearing

Tengfei Xu (Xi'an Jiaotong University, P.R. China)

Method and Device for Large Rotor Bearing Force Measurement

Risto Viitala (Aalto University, Finland)
Raine Viitala (Aalto University, Finland)
Petri Kuosmanen (Aalto University, Finland)

13:00 – 15:00

HP2: Special Session 4: Capacitive Sensing in Harsh Environments by TC-9

Room: Tasman 2

Distributed Passive Sensor for Moisture Sensing in Structures

Markus Neumayer (Graz University of Technology, Austria)
Thomas Suppan (Graz University of Technology, Austria)
Matthias Flatscher (Graz University of Technology, Austria)
Thomas Bretterkieber (Graz University of Technology, Austria)

Piezocapacitive Sensing for Structural Health Monitoring in Adhesive Joints

Christian Stetco (Alpen-Adria Universität, Austria)
Omid Sam-Daliri (University of Tehran, Iran)
Lisa-Marie Faller (Alpen-Adria-Universität Klagenfurt, Austria)
Hubert Zangl (Alpen-Adria Universität, Austria)

A Kalman Filter Approach for the Application of Electrical Capacitance Tomography in Dynamic Processes using a State Reduction

Thomas Suppan (Graz University of Technology, Austria)
Markus Neumayer (Graz University of Technology, Austria)
Thomas Bretterkieber (Graz University of Technology, Austria)
Stefan Puttinger (Johannes Kepler University Linz, Austria)

Investigation of pressurized gas-liquid two-phase flow with electrical capacitance tomography

Shiguo Liang (Institute of Engineering Thermophysics, Chinese Academy of Sciences, P.R. China)
Ruican Wang (Institute of Engineering Thermophysics, Chinese Academy of Sciences, P.R. China)
Haigang Wang (University of Manchester, United Kingdom (Great Britain))
Jiamin Ye (Institute of Engineering Thermophysics Chinese Academy of Sciences, P.R. China)
Wuqiang Yang (The University of Manchester, United Kingdom (Great Britain))

Application of electrical capacitance tomography in pharmaceutical manufacturing processes

Wuqiang Yang (The University of Manchester, United Kingdom (Great Britain))
Haigang Wang (University of Manchester, United Kingdom (Great Britain))

Multiphase Flow Measurement by Electrical Capacitance Tomography and Microwave Cavity Resonant Sensor

Mimi Faisyalini Ramli (Universiti Tun Hussein Onn, Malaysia)

Wenbin Tian (Beihang University, P.R. China)

Heron Eduardo de Lima Ávila (Federal University of Santa Catarina, Brazil)

Fernando Rangel de Sousa (Federal University of Santa Catarina, Brazil)

Wuqiang Yang (The University of Manchester, United Kingdom (Great Britain))

13:00 - 15:00

HP3: Sensors and Transducers - 2

Room: Aucklander

High Performance Flame-Made Ultraporous ZnO-Based QCM Sensor For Acetaldehyde

Nicola Donato (University of Messina, Italy)

Salvatore Gianluca Leonardi (University of Messina, Italy)

Giovanni Neri (University of Messina, Italy)

Antonio Tricoli (Australian National University, Italy)

Zelio Fusco (Australian National University, Italy)

"Paper"Based Sensor for Deformation Measurements

Carlo Trigona (University of Catania, Italy)

Salvatore Graziani (University of Catania, Italy)

Giovanna Di Pasquale (University of Catania, Italy)

Antonino Pollicino (Univesrità di Catania, Italy)

Optimization of Turbine Flow Sensor Structure based on the Velocity Distribution Inlet

Suna Guo (Hebei University, P.R. China)

Song Wang (He Bei University, P.R. China)

Xin Zheng (Hebei University, P.R. China)

Ning Zhao (Tianjin University, P.R. China)

Lide Fang (Hebei University, P.R. China)

Xiaoting Li (Hebei University, P.R. China)

Irradiation of Experimental Temperature Sensors in the MIT Research Reactor

Joshua E Daw (Idaho National Laboratory, USA)

Lance Hone (Idaho National Laboratory, USA)

Kevin Chen (Pittsburgh University, USA)

Mohamed Zaghloul (The University of Pittsburgh, USA)

David Carpenter (The Massachusetts Institute of Technology, USA)

Simon Nehr (CEA, France)

Guillaume Laffont (CEA, France)

Romain Cotillard (CEA, France)

Jean-Francois Villard (CEA, France)

Christophe Destouches (CEA, France)

An improved Richardson-Lucy algorithm for star image deblurring

Di Liu (School of Instrument Science and Engineering, Southeast University, P.R. China)

Xiyuan Chen (Southeast University, P.R. China)

Xiao Liu (School of Instrument Science and Engineering, Southeast University, P.R. China)

A Nonlinear Harvester to Scavenge Energy from Rotational Motion

Vincenzo Marletta (University of Catania, Italy)

Bruno Andò (University of Catania, Italy)

Salvatore Baglio (University of Catania, Italy)

Adi R. Bulsara (Space and Naval Warfare Center (San Diego), USA)

Roberto La Rosa (STMicroelectronics, Italy)

13:00 – 15:00

HP4: Signal Processing - 2

Room: Millennium 1

Convolutional neural networks for robust angular measurement with xMR sensor arrays

Phil Meier (Ostfalia University of Applied Sciences, Germany)

Kris Rohrmann (Ostfalia University of Applied Sciences, Germany)

Marvin Sandner (Ostfalia Hochschule für Angewandte Wissenschaften, Germany)

Martin Streitenberger (University of Applied Science of Hannover, Germany)

Marcus Prochaska (Ostfalia University of Applied Sciences, Germany)

Behavioral Modeling of an Inductive Voltage Transformer: Comparison Between X-Parameters and Simplified Volterra Approaches

Marco Faifer (Politecnico di Milano, Italy)

Christian Laurano (Politecnico di Milano, Italy)

Roberto Ottoboni (Politecnico di Milano, Italy)

Sergio Toscani (Politecnico di Milano, Italy)

Michele Zanoni (Politecnico di Milano, Italy)

Adaptive Rate Signal Acquisition and Denoising For Efficient Mobile Systems

Saeed Mian Qaisar (Effat University, Jeddah, KSA & INPG, ENSEIRB, France)

Dominique Dallet (IMS Laboratory - Bordeaux INP - University Bordeaux, France)

Sarah Niyazi (Effat University, Saudi Arabia)

Ultrasound TDoA positioning using the Best Linear Unbiased Estimator

Antonella Comuniello (University of Perugia, Italy)

Alessio De Angelis (University of Perugia, Italy)

Antonio Moschitta (University of Perugia, Italy)

Noise Variance and Signal-to-Noise Ratio Estimation from Spectral Data

Stefan Schuster (Voestalpine Stahl Gmbh & Institute for Communications and Information Engineering, Austria)

Dominik Exel (Johannes Kepler University Linz, Austria)

Stefan Scheiblhofer (Voestalpine Stahl GmbH, Austria)

Dominik Zankl (Voestalpine Stahl GmbH, Austria)

Vera Ganglberger (Voestalpine Stahl GmbH, Austria)

Johann Reisinger (Voestalpine Stahl GmbH, Austria)

Bernhard G. Zagar (University of Linz, Austria)

13:00 – 15:00

HP5: Special Session 6/7: Medical/Biological Instrumentation and measurements for ambient intelligence applications by TC-25

Room: Millennium 2

Signal Classification Algorithm in Motor Imagery Based on Asynchronous Brain-Computer Interface

Yu Jiang (Harbin Institute of Technology, P.R. China)
Jingyan He (Harbin Institute of Technology, P.R. China)
Dandan Li (Harbin Institute of Technology & None, P.R. China)
Jing Jin (Harbin institute of Technology, P.R. China)
Shen Yi (Harbin Institute of Technology, P.R. China)

An imaging system for microbial corrosion analysis

Leonardo Iannucci (Politecnico di Torino, Italy)
Luca Lombardo (Politecnico di Torino, Italy)
Marco Parvis (Politecnico di Torino, Italy)
Pierangela Cristiani (Ricerca sul Sistema Energetico - RSE SpA, Italy)
Régine Basséguy (Université de Toulouse, CNRS, INPT, UPS, France)
Emma Paola Angelini (Politecnico di Torino, Italy)
Sabrina Grassini (Politecnico di Torino, Italy)

A wearable system for noise assessment in workplaces

Luca Lombardo (Politecnico di Torino, Italy)
Leonardo Iannucci (Politecnico di Torino, Italy)
Marco Parvis (Politecnico di Torino, Italy)
Sabrina Grassini (Politecnico di Torino, Italy)
Simone Corbellini (Politecnico di Torino, Italy)

Smart meters and water leakage detection: a preliminary study

Consolatina Liguori (University of Salerno, Italy)
Francesco Abate (University of Salerno, Italy)
Marco Carratu' (University of Salerno, Italy)
Antonio Pietrosanto (University of Salerno & CEO of SPRING OFF srl, Italy)

IoT-based Architectures for Sensing and Local Data Processing in Ambient Intelligence: Research and Industrial Trends

Yang Cai (Carnegie Mellon University, USA)
Angelo Genovese (Università degli Studi di Milano, Italy)
Vincenzo Piuri (Università degli Studi di Milano, Italy)
Fabio Scotti (Università degli Studi di Milano, Italy)
Mel Siegel (Carnegie Mellon University, USA)

Architecture for the interconnection of prototypical medical instrument via cloud services

Dhiego Fernandes Carvalho (University of Brescia, Italy)
Paolo Bellagente (University of Brescia, Italy)
Alessandro Depari (University of Brescia, Italy)
Paolo Ferrari (University of Brescia, Italy)
Alessandra Flammini (University of Brescia, Italy)
Stefano Rinaldi (University of Brescia, Italy)
Emiliano Sisinni (University of Brescia, Italy)

15:00 – 15:30

Afternoon Tea

Room: Atrium/Annexe

1: Utilizing run-out measurements in developing the production of large welded tube rolls

Tuukka Mustapää (Aalto University, Finland)

Raine Viitala (Aalto University, Finland)

Petri Kuosmanen (Aalto University, Finland)

2: Measurement of Relative Position and Orientation using UWB

Ernst Theussl (University of Leoben, Austria)

Dimitar Ninevski (University of Leoben, Austria)

Paul O'Leary (University of Leoben, Austria)

3: A Novel Fault Detection Method for Semiconductor Manufacturing Processes

Zhen Sun (Harbin Institute of Technology, P.R. China)

Jingli Yang (Harbin Institute of Technology, P.R. China)

Kexin Zheng (Harbin Institute of Technology, P.R. China)

4: Optimized Neural Network of Predictive Maintenance for Air Booster Compressor (ABC) Motor Failure

Rosli Nurfatihah Syalwiah (Universiti Teknologi PETRONAS, Malaysia)

Rosdiazli Ibrahim (Universiti Teknologi PETRONAS, Malaysia)

Idris bin Ismail (Universiti Teknologi PETRONAS, Malaysia)

5: Flow and phase volume fraction measurement of bubble flow

Lide Fang (Hebei University, P.R. China)

Song Wang (He Bei University, P.R. China)

Chen Xie (He Bei University, P.R. China)

Wei Zihui (Hebei Universit, P.R. China)

Xiaoting Li (Hebei University, P.R. China)

6: Fuzzy Pressure Control System in water supply networks with series-parallel pumps

Thommas Flores (Federal University of Paraiba, Brazil)

Juan Moises Mauricio Villanueva (Federal University of Paraiba & UFPB, Brazil)

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

Heber Gomes (Federal University of Paraiba, Brazil)

7: Experimental characterization of off-the-shelf LEDs as photodetectors for waking up microcontrollers

Edgar Ripoll-Vercellone (Universitat Politècnica de Catalunya & Idneo Technologies S.A.U, Spain)

Manel Gasulla (Universitat Politècnica de Catalunya, Spain)

Ferran Reverter (Universitat Politècnica de Catalunya, Spain)

Vicent Ferrandiz (Idneo Technologies S.A.U, Spain)

8: Gas Fraction Measurements using Single and Dual Beam Gamma-Densitometry for Two Phase Gas-Liquid Pipe Flow

Stian Husevik Stavland (University of Bergen & NORCE, Norway)
Camilla Sætre (University of Bergen, Norway)
Bjørn Tore Hjertaker (University of Bergen, Norway)
Stein-Arild Tjugum (Roxar Emerson Process Management, Norway)
Anders Hallanger (Norce, Norway)
Rachid Maad (University of Bergen, Norway)

9: Design of Ultrasonic Tomography System for Biomedical Imaging

Libo Wen (Tianjin University, P.R. China)
Chao Tan (Tianjin University, P.R. China)
Feng Dong (Tianjin University, P.R. China)
Shu Zhao (Chinese Academy of Medical Sciences and Peking Union Medical College, P.R. China)

10: Automated Analytical Measurement System for Determination of Cholesterol in Pig Bile

Heidi Fleischer (University of Rostock, Germany)
Thomas Roddelkopf (Center for Life Science Automation - CELISCA, Germany)
Regina Stoll (University of Rostock - Institute for Preventive Medicine, Germany)
Kerstin Thurow (Center for Life Science Automation - CELISCA, Germany)

11: Correlating foot posture with foot mobility using a high-accuracy foot measurement system

Duaa Alshadli (Unitec Institute of Technology, New Zealand)

12: An Automated Hearing Test Equipment Based on Active Noise Control Technology

Chao Sun (Harbin Institute of Technology, P.R. China)
Yuqi Liu (Harbin Institute of Technology, P.R. China)
Xinglong Wang (Harbin Institute of Technology, P.R. China)

13: Visible Spectrum-based Classification of Malaria Blood Samples on Handheld Spectrometer

Maitreya Maity (Indian Institute of Technology Kharagpur, India)
Kripasindhu Gantait (Midnapore Medical College and Hospital, India)
Anirban Mukherjee (Indian Institute of Technology Kharagpur, India)
Jyotirmoy Chatterjee (IIT Kharagpur, India)

14: Visualization of in-vitro Blood Vessels in Contrast Images Based on Discrete Wavelet Transform Decomposition

Francisco Lopez-Tiro (INAOE, Mexico)
Hayde Peregrina-Barreto (Instituto Nacional de Astrofísica, Óptica y Electrónica, Mexico)
Jose J. Rangel-Magdaleno (INAOE, Mexico)
Julio Cesar Ramirez-San-Juan (INAOE, Mexico)

15: Pulse-Shaping Feed-Forward-Compensated Generator

Sinduja Seshadri (University of Waikato & Saluda Medical, New Zealand)
Jonathan Scott (University of Waikato, New Zealand)

16: Description of breast density based on a homogeneity representation

Ingrid Valencia-Hernandez (INAOE, Mexico)
Hayde Peregrina-Barreto (Instituto Nacional de Astrofísica, Óptica y Electrónica, Mexico)
Carlos A. Reyes-García (Instituto Nacional de Astrofísica Óptica y Electrónica-INAOE, Mexico)
Juan Ramirez-Cortes (INAOE, Mexico)

17: Estimation of blood vessels diameter by region growing in laser speckle contrast imaging

Eduardo Morales-Vargas (INAOE, Mexico)

Hayde Peregrina-Barreto (Instituto Nacional de Astrofísica, Óptica y Electrónica, Mexico)

Jose J. Rangel-Magdaleno (INAOE, Mexico)

Julio Cesar Ramirez-San-Juan (INAOE, Mexico)

18: A formal analysis approach for verifying the design of respiratory pacing devices

Vinod Suresh (University of Auckland, New Zealand)

Chad Eichler (University of Auckland, New Zealand)

Partha Roop (University of Auckland, New Zealand)

19: Classification of short unsegmented heart sound based on deep learning

Sinam Ajitkumar Singh (North Eastern Regional Institute of Science and Technology, India)

Swanirbhar Majumder (Tripura University, India)

Madhusudhan Mishra (Indian Institute of Technology, Kharagpur & NERIST, India)

20: Low Profile and Low Cost Textile Smart Mat for Step Pressure Sensing and Position Mapping

Erfeng Li (Auckland University of Technology, New Zealand)

Xiaoyou Lin (University of Waikato, New Zealand)

Boon-Chong Seet (Auckland University of Technology, New Zealand)

Frances Joseph (Auckland University of Technology, New Zealand)

Jonathon Neville (Griffith University, Australia)

21: Finite element method guided measurement of temperature profile in tissue exposed to a transcutaneous energy transfer system

Shun Long Cyril Au (University of Auckland, New Zealand)

Ho Yan Leung (University of Auckland, New Zealand)

David Dudgett (University of Auckland, New Zealand)

Daniel McCormick (University of Auckland, New Zealand)

22: Using the body to self-cool a 10 W transcutaneous energy transfer system

Quinn Boesley (The University of Auckland, New Zealand)

David Dudgett (University of Auckland, New Zealand)

Daniel McCormick (University of Auckland, New Zealand)

Ho Yan Leung (University of Auckland, New Zealand)

23: Physical Rehabilitation based on Smart Wearable and Virtual Reality Serious Game

Ricardo Alexandre (ISCTE-IUL, Portugal)

Octavian Adrian Postolache (Instituto de Telecomunicações, Lisboa/IT & Instituto

Universitario de Lisboa, ISCTE-IUL, Portugal)

Pedro Girão (Institute of Telecommunications (IT), Portugal)

24: The use of an intra-vaginal pressure sensor device to evaluate changes in intra-vaginal pressure profiles pre and post pelvic organ prolapse surgery

Laura Pedofsky (University of Auckland, New Zealand)

David Dudgett (University of Auckland, New Zealand)

Poul F Nielsen (University of Auckland, New Zealand)

Jackie Smalldridge (University of Auckland, New Zealand)

Lynsey Hayward (University of Auckland, New Zealand)

Jennifer Kruger (University of Auckland, New Zealand)

25: An Energy Efficient Protocol for Wireless Body Area Network of Health Sensors

Nathan Geddes (Massey University, New Zealand)
Gourab Sen Gupta (Massey University, New Zealand)
Faraz Hasan (Massey University, New Zealand)

26: Low-Cost Readout Electronics for Piezoresistive MEMS-Based Transducers

Diego Barrettino (Swiss Federal Institute of Technology Lausanne (EPFL))
Denis Ferreira (Axentra Swisstech SA, Switzerland)
Marco Mattavelli (EPFL, Switzerland)

27: Liquid film thickness measurement for gas-liquid two phase flow using ultrasound

Mi Wang (Tianjin University, P.R. China)
Dandan Zheng (Tianjin University, P.R. China)
Ying Xu (Tianjin University, P.R. China)
Ziqiang Cui (Tianjin University, P.R. China)

28: Image Reconstruction Based on Regularized Weighted Least Square Framework for Low-Contrast Ultrasonic Tomography

Hao Liu (Tianjin University, P.R. China)
Chao Tan (Tianjin University, P.R. China)
Feng Dong (Tianjin University, P.R. China)
Shu Zhao (Chinese Academy of Medical Sciences and Peking Union Medical College, P.R. China)

29: Non-Destructive Characterization of Glass Laminated Electronics

Janne Lauri (Optoelectronics and Measurement Techniques Research Unit, Finland)
Esa Hannila (Optoelectronics and Measurement Techniques Research Unit, Finland)
Tapio Fabritius (University of Oulu, Finland)

30: Optical Analysis and Correction for Circumferential Liquid Film Measurement Based on Planar Laser-induced Fluorescence Method

Ting Xue (Tianjin University, P.R. China)
Chenyang Li (College of Electrical and Information Engineering, P.R. China)
Qian Wang (University of Tianjin, P.R. China)

31: Instrument Design for Digital Thermal Conductivity Measurement

Wenbin Zheng (Harbin Institute of Technology, P.R. China)
Feng Lei (Harbin Institute of Technology, P.R. China)
Bing Liu (Harbin Institute of Technology, P.R. China)
Ping Fu (Harbin Institute of Technology, P.R. China)
Hongtao Yin (Harbin Institute of Technology, P.R. China)
Qiao JiaQing (Harbin Institute of Technology, P.R. China)
Shengwei Meng (Harbin Institute of Technology, P.R. China)

32: Visual inspection of CFRP laminates based on EIT

Wenru Fan (Civil Aviation University of China, P.R. China)
JingYao Li (Civil Aviation University of China, P.R. China)
Ziqiang Cui (Tianjin University, P.R. China)
Huaxiang Wang (Tianjin University, P.R. China)

33: Evaluation of Voltage-driven Electrical Resistance Tomography Using LCR Meter-based Measurement System

Chao Wang (Tianjin University, P.R. China)
Qing Cao (Tianjin University, P.R. China)
Ziqiang Cui (Tianjin University, P.R. China)
Yuxiang Chen (Tianjin University, P.R. China)
Huaxiang Wang (Tianjin University, P.R. China)

34: Optimization of ESA for Velocity Distribution Measurement Based on Cross-correlation Sensitivity Weighting Method

Chao Wang (Tianjin University, P.R. China)
Shuai Zhang (Tianjin University, P.R. China)
Ya Li (Tianjin University, P.R. China)
Lin Jia (Tianjin University, P.R. China)

35: A novel measurement method to investigate dynamics of single acoustic bubble near a rigid wall

Hao Wu (Tianjin University, P.R. China)
Haixia Yu (Tianjin University, P.R. China)
Jiaming Ma (Tianjin University, P.R. China)
Cheng Zhou (Tianjin University, P.R. China)
Zhihua Pu (Tianjin University, P.R. China)
Dachao Li (Tianjin University, P.R. China)

36: A robust Doppler shift-based velocimetry via using tunable diode laser absorption spectroscopy

Hongyu Zhang (Beihang University, P.R. China)
Lijun Xu (Beihang University, P.R. China)
Liu Yong Chang (Beihang University, P.R. China)
Zhang Cao (Beihang University, P.R. China)

37: 3D Printed Chest Models with Realistic Shape and Electrical Property for Electrical Impedance Tomography

Liu Yang (Tianjin University, P.R. China)
Yue (Tianjin University, P.R. China)
Zeying Wang (Tianjin University, P.R. China)
Xiaoyuan Liu (Tianjin University, P.R. China)
Huaxiang Wang (Tianjin University, P.R. China)

38: Investigation of ultrasonic NDT for small diameter and thin-wall tube

Xiang Xiao (University of Electronic Science and Technology of China, P.R. China)
Bin Gao (University of Electronic Science and Technology, P.R. China)
Guiyun Tian (Newcastle University & University of Electronic Science and Technology of China, United Kingdom (Great Britain))

39: Design of a Low Complexity Interference Detector for LPWA Networks

Chhayarith Heng Uy (Université Grenoble Alpes & Gipsa-Lab, CEA, Leti, France)
Carolynn Bernier (CEA/Leti - Minatec, France)
Sylvie Charbonnier (Gipsa-lab INPG-CNRS, France)

40: Enhancements in Anomaly Detection in Body Sensor Networks

Ruth Sandra (Christ University, India)
Raymond Joseph (IIT Madras, India)

41: Natural frequency measurement of pipe vibration for vortex flowmeter

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

Wei Wang (School of Electrical and Information Engineering, Tianjin University, P.R. China)

Hongbing Ding (Tianjin University, P.R. China)

Jinxia Li (Tianjin University, P.R. China)

Chongmeng Zhang (Tianjin Navigation Instrument Research Institute, Tianjin, P.R. China)

42: Research on an omnidirectional proton precession magnetometer sensor based on solenoidal coils

Wang Luo (China University of Geosciences (Wuhan), P.R. China)

Haobin Dong (China University of Geosciences, P.R. China)

Jian Ge (China University of Geosciences, P.R. China)

Huan Liu (China University of Geosciences (Wuhan), P.R. China & University of British Columbia, Canada)

Hengli Song (China University of Geosciences, P.R. China)

Cheng Zhang (China University of Geosciences, P.R. China)

Zhiwen Yuan (Science and Technology on Near-Surface Detection Laboratory, P.R. China)

Jun Zhu (Science and Technology on Near-Surface Detection Laboratory, P.R. China)

Haiyang Zhang (Science and Technology on Near-Surface Detection Laboratory, P.R. China)

43: Digital Eddy Current Probe for Tube Nondestructive Testing Using Binary Excitation

Dorijan Špikić (University of Zagreb, Croatia)

Robert Tutić (University of Zagreb, Croatia)

Darko Vasić (University of Zagreb, Croatia)

Davorin Ambruš (University of Zagreb, Croatia)

Vedran Bilas (University of Zagreb, Croatia)

44: Design on Electromagnetic Detection Sensor on Wear Debris in Lubricating Oil

Yimeng Li (Beihang University, P.R. China)

Jing Wu (Beihang University, P.R. China)

Qiang Guo (Beihang University, P.R. China)

45: Investigation on optimal detection position of DC electromagnetic NDT in crack characterization for high-speed rail track

Fei Yuan (University of Electronic Science and Technology of China, P.R. China)

Yating Yu (University of Electronic Science and Technology of China, P.R. China)

Bowen Liu (University of Electronic Science and Technology of China, P.R. China)

Linfeng Li (University of Electronic Science and Technology of China, P.R. China)

46: A Hall Effect based Through Shaft Angle Sensor - Analysis and Signal Conditioning

Chandrika Sreekantan Anoop (Indian Institute of Space Science and Technology, India)

British Sontakke (Indian Institute of Space Science and Technology, India)

Rahul Kumar (Indian Institute of Space Science and Technology, India)

47: Excitation Characteristics of Ultrasonic Probe

Zeng Qiaoqiao (Hebei University, P.R. China)

Lide Fang (Hebei University, P.R. China)

Yu Xiaofei (Hebei University, P.R. China)

Xiaoting Li (Hebei University, P.R. China)

Ning Zhao (Tianjin University, P.R. China)

48: Design and development of a kinetic energy harvester device for oceanic drifter applications

Matias Carandell (Universitat Politecnica de Catalunya, Spain)
Daniel M Toma (Technical University of Catalonia, Spain)
Montserrat Carbonell-Ventura (Universitat Politècnica de Catalunya, Spain)
Manel Gasulla (Universitat Politècnica de Catalunya, Spain)
Joaquin del Rio (Universitat Politecnica de Catalunya, Spain)

49: Verification for Electrical Tomography in Flame Monitoring by Ion Probe

Die Hu (Beihang University, P.R. China)
Lijun Xu (Beihang University, P.R. China)
Zhang Cao (Beihang University, P.R. China)
Shijie Sun (Beihang University, P.R. China)
Jiangtao Sun (Beihang University, P.R. China)

50: Investigation of granule moisture measurement by a microwave resonant cavity sensor

Wenbin Tian (Beihang University, P.R. China)
Jiangtao Sun (Beihang University, P.R. China)
Shijie Sun (Beihang University, P.R. China)
Duan Li (Beihang University, P.R. China)
Lijun Xu (Beihang University, P.R. China)
Hanqiao Che (Beihang University, P.R. China)
Wuqiang Yang (The University of Manchester, United Kingdom (Great Britain))
Fernando Rangel de Sousa (Federal University of Santa Catarina, Brazil)

51: Measurement of Weak Signal Energy at Acoustic Frequencies by using RMSHI as a Passive Conditioning Circuit

Marko Gazivoda (Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia)
Dinko Oletic (University of Zagreb & Faculty of Electrical Engineering and Computing, Croatia)
Carlo Trigona (University of Catania, Italy)
Vedran Bilas (University of Zagreb, Croatia)

52: Smart Wall: Passive Visible Light Positioning with Ambient Light Only

Nathaniel Faulkner (Massey University, New Zealand)
Fakhrul Alam (Massey University, New Zealand)
Mathew Legg (Massey University, New Zealand)
Serge Demidenko (Sunway University, Malaysia)

53: Performance study of a two-electrode type aqueous conductivity sensor for smart farming

Avishek Adhikary (Indian Institute of Technology Bhilai, India)
Joydip Roy (Indian Institute of Technology Kharagpur, India)
Karabi Biswas (Indian Institute of Technology Kharagpur, India)

54: A novel boost algorithm exploiting adjacent sparsity pattern

Jingchao Zhang (Harbin Institute of Technology, P.R. China)
Liyao Qiao (Harbin Institute of Technology, P.R. China)

55: Adaptive Sparse Representation for Kronecker Compressive Sensing

Zhao Rongqiang (Harbin Institute of Technology, P.R. China)
Qiang Wang (Harbin Institute of Technology, P.R. China)
Zhihong Qian (Jilin University, P.R. China)
Xiang Ma (Harbin Institute of Technology, P.R. China)

56: A tensor higher-order singular value decomposition for denoising of rolling element bearings with compound fault

Yanxue Wang (Beijing University of Civil Engineering and Architecture, P.R. China)
Chaofan Hu (Beijing University of Civil Engineering and Architecture, P.R. China)
Tangbo Bai (Beijing University of Civil Engineering and Architecture, P.R. China)

57: Estimation of Speed and Tracking of Vehicles using Radar Duet

Akhilesh Kumar (Indian Institute of Technology Kharagpur, India)
Anirban Mukherjee (Indian Institute of Technology Kharagpur, India)
Mahendra Mandava (ACI, USA)

58: Joint Carrier and 2D-DOA Estimation for MWC Based on Two L-Shaped Arrays

Siyi Jiang (Harbin Institute of Technology, P.R. China)
Ning Fu (Harbin Institute of Technology, P.R. China)
Liyan Qiao (Harbin Institute of Technology, P.R. China)
Zhiliang Wei (Harbin Institute of Technology, P.R. China)

59: Large Measurement Regression: Hierarchical Least Squares Multisplitting

Gilles Inghelbrecht (Vrije Universiteit Brussel, Belgium)
Kurt Barbé (Vrije Universiteit Brussel & Faculty of Sciences, Belgium)

60: Carrier Frequency Offset Estimation Based on Twice FFT Matrix Algorithm

Jie Meng (University of Electronic Science and Technology of China, P.R. China)
Houjun Wang (University of Electronic Science and Technology of China, P.R. China)
Ye Peng (University of Electronic Science and Technology of China, P.R. China)
Lianping Guo (University of Electronic Science and Technology of China, P.R. China)
Yu Zhao (University of Electronic Science and Technology of China, P.R. China)
Wentao Wei (University of Electronic Science and Technology of China, P.R. China)
Hao Zeng (University of Electronic Science and Technology of China, P.R. China)

61: Mitigating the Effect of Obstacles in Narrowband Ultrasonic Localization Systems

Sebastian Haigh (University of South Wales, United Kingdom (Great Britain))
Janusz Kulon (University of South Wales, United Kingdom (Great Britain))
Adam Partlow (Cardiff & Vale University Health Board, United Kingdom (Great Britain))
Paul Rogers (Cardiff & Vale University Health Board, United Kingdom (Great Britain))
Colin Gibson (Cardiff & Vale University Health Board, United Kingdom (Great Britain))

62: Bearing Fault Detection Technique by using Thermal Images: A case of Study

Carlos Morales-Perez (National Institute for Astrophysics, Optics and Electronics, Mexico)
Jose J. Rangel-Magdaleno (INAOE, Mexico)
Hayde Peregrina-Barreto (Instituto Nacional de Astrofísica, Óptica y Electrónica, Mexico)
Juan Ramirez-Cortes (INAOE, Mexico)
Emmanuel Vazquez-Pacheco (BUAP, Mexico)

63: A simplified and universal resistance response of gas sensor of IoT circuit Platform

Tai-Shan Liao (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)
Heh-Nan Lin (National Tsing Hua University, Taiwan)
Long-Jeng Lee (Instrument Technology Research Center, National Applied Research Laboratories, Taiwan)

64: Reducing the Time Consumption of Vibration Correction Methods for Absolute Gravimeters

Meiying Guo (Tsinghua University, P.R. China)
Kang Wu (Tsinghua University, P.R. China)
Jiamin Yao (Tsinghua University, P.R. China)
Yi Wen (Tsinghua University, P.R. China)
Zhenxing Li (Tsinghua University, P.R. China)
Lijun Wang (Tsinghua University, P.R. China)

65: Jitter Measurement in Digital Signals by Using Software Defined Radio Technology

Gehan Anthonys (University of Waikato, New Zealand)
Michael J. Cree (University of Waikato, New Zealand)
Lee Streeter (University of Waikato, New Zealand)

66: Full-waveform LiDAR Echo Filtering Based on Blind Source Separation

Duan Li (Beihang University, P.R. China)
Lijun Xu (Beihang University, P.R. China)
Xiaolu Li (Beihang University, P.R. China)
Jiangtao Sun (Beihang University, P.R. China)
Shijie Sun (Beihang University, P.R. China)
Wenbin Tian (Beihang University, P.R. China)

67: Rotational speed measurement based on a state space observation within a tracking demodulation method using xMR angular sensors

Marvin Sandner (Ostfalia Hochschule für Angewandte Wissenschaften, Germany)
Kris Röhrmann (Ostfalia University of Applied Sciences, Germany)
Marcus Prochaska (Ostfalia University of Applied Sciences, Germany)
Phil Meier (Ostfalia University of Applied Sciences, Germany)

68: UWB Antenna Based Time-Domain Approach for Through the Walls Gap Estimation

Faraz Shaikh (International Islamic University Malaysia, Malaysia)
Sheroz Khan (International Islamic University Malaysia, Malaysia)
Ahm Zahirul Alam (International Islamic University Malaysia, Malaysia)
Kushsairy Kadir (Universiti Kuala Lumpur British Malaysian Institute, Malaysia)
Mohamed Hadi Habaebi (International Islamic University Malaysia (IIUM), Malaysia)
Dominique Baillargeat (University of Limoges, CNRS, XLIM, France)
Jawad Shah (UniKL, Malaysia)
Zeeshan Shahid (IIUM, Malaysia)
Muhammad Yahya (Universiti Kula Lumpur, Malaysia)

69: Fine Resolution Position Estimation Using Kalman Filtering

Brian Sun (12520 Springwood dr, USA)
Mark Yeary (University of Oklahoma, USA)
Hjalte Sigmarsson (University of Oklahoma, USA)
Jay W McDaniel (University of Oklahoma & Advanced Radar Research Center, USA)

70: Initial Estimation of Wiener-Hammerstein System with Random Forest

Md Abu Hanif Shaikh (Vrije Universiteit Brussel, Belgium)
Kurt Barbé (Vrije Universiteit Brussel & Faculty of Sciences, Belgium)

71: Accurate and quickly responsive surface temperature measurement: a step to widespread non-invasive T-measurement in industry

Jörg Gebhardt (ABB AG Corporate Research Germany, Germany)

Wilhelm Daake (ABB Automation Products GmbH, Minden, Germany)

Peter Ude (ABB Automation Products GmbH, Minden, Germany)

Karsten Schroeder (ABB Automation Products GmbH, Minden, Germany)

Guruprasad Sosale (ABB Automation Products GmbH, Mannheim, Germany)

17:30 – 18:00

Closing Ceremony/Sensors & Measurement Student Contest Awards

Room: Millennium Ballroom

