TENERIFE

SEIA'19

5th International Conference on Sensors and Electronic Instrumentation Advances

&

1st IFSA Frequency & Time Conference

Conference Programme

25-27 September 2019
Adeje, Tenerife (Canary Islands), Spain

Organized by:

IFSA

Message from Chairman

On behalf the Organizing Committee we would like to welcome you to the 5th International Conference on Sensors and Electronic Instrumentation Advances (SEIA' 2019) and 1st IFSA Frequency & Time Conference (IFTC' 2019), on Tenerife (Canary Islands), Adeje, Spain. This conference umbrella is a forum for presentation, discussion, exchange of information and latest research and development results in both theoretical and experimental research in sensors, transducers (including frequency output sensors), sensor instrumentation, measurements and their related fields. It brings together researchers, developers, and practitioners from diverse fields including international scientists and engineers from academia, research institutes, and companies to present and discuss the latest results in the field of sensors and measurements. The first SEIA conference was held in Dubai (UAE), 21-22 November 2015; the second – in Barcelona (Spain), 22-23 September 2016; the third – in Moscow (Russia), 20-22 September 2017, and the fourth - in Amsterdam (The Netherlands), 19-21 September 2018.

Next to all the technical subjects, a major function of this series of events lies in the opportunities for meeting colleagues. This aspect of our IFSA events has always been giving high marks and we continue to pay much attention to it. Coffee breaks, welcome cocktail reception, panel discussion are the best opportunity for social contacts. Finally, the quality of the memorable Gala Dinner, organized on Thursday evening will make your stay on Tenerife into a very pleasant souvenir.

Both conferences are organized by the *International Frequency Sensor Association (IFSA)* - one of the major professional association serving for the sensor industry and academy during 20 years, in technical cooperation with IFSA Group companies: *IFSA Publishing S.L.* (Spain) and *F2D, Ltd.* (Ireland), and media partners: Open Access MDPI journals *Sensors* (ISSN 1424-8220) and *Biosensors* (ISSN 2079-6374), Switzerland.

We trust that you will find the SEIA' 2019 and IFTC' 2019 conferences professionally rewarding and stimulating as well as enjoyable. Welcome to SEIA' 2019 and IFTC' 2019 !

Prof., Dr. Sergey Y. Yurish
SEIA' 2019 & IFTC' 2019 Chairman

Registration

The Registration Desk is open in the Hard Rock Hotel Convention Center near the Wembley I, II conference rooms:

- Tuesday, 24 September, form 17:00-18:00
- Wednesday, 25 September, from 8:45-18:00
- Thursday, 26 September, from 8:45-18:00
- Friday, 27 September, from 8:45 to 13:00

Conference Venue

The Conference will take place on 25-27 September 2019 in the Hard Rock Hotel and Convention Center, Tenerife (Canary Islands), Adeje, Spain, on the ground floor in the conference rooms Wembley I, II.

Language

The official language of the Conference is English. There will be no simultaneous interpretation.

Insurance and Liability

The conference organizers do not accept responsibility for any individual, medical, travel or personal insurance policies as necessary.

Conference Identification Tag

The Organizing Committee request that you wear your identification tag (badge) at all times during the conference. Your conference identification tag will serve as your admission to all conference paper presentation sessions.

Coffee/Tea Refreshment

Coffee/tea will be served at the times indicated in the programme.

Special Issues of journals

Selected papers from both conferences will be published in special issues of open access *Sensors & Transducers* journal (ISSN: 2306-8515, e-ISSN 1726-5479) in both: print and electronic formats; MDPI *Sensors* journal (ISSN 1424-8220) and MDPI *Biosensors* journal (ISSN 2079-6374) in electronic format and *Soft Measurements and Computing journal* (ISSN 2618-9976) in print and electronic formats. All authors of selected papers will be invited after the conference by the Chairman to submit their extended papers into the appropriate journals.

'Advances in Sensors: Reviews' Book Series

The limited number of full-page papers published in the *Sensors & Transducers* journal will be selected by the journal's Editorial Board to extend into book chapters for the '*Advances in Sensors: Reviews*', Book Series, Vol. 8. This open access

book volume will be published in 2020. The first seven volumes published in 2012-2019 have accepted by all Sensors Community with a great enthusiasm.

Best Paper Award on Biosensors

MDPI *Biosensors* (ISSN 2079-6374) Open Access journal has announced the Biosensors Best Paper Award (500.00 CHF), which will be given to the authors of the best paper devoted to biosensors and presented at the SEIA' 2019 conference. The winner will be able to publish one paper free of charge in the *Biosensors* Open Access journal.

Organizing Committee

Chairmen

Prof., Dr. Sergey Y. Yurish *(IFSA, Spain)*
Dr. Daneshmand Malayeri, Amin *(Asia-SAME, UAE)*

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Prof. Dr. Gennaro Conte *(University Roma Tre, Italy)*
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Prof. George Kiriakidis (*European Materials Research Society France*)
Dr. Pavel Shuk *(Emerson Process Management, USA)*
Dr. Marius Gheorghe *(Ideal Aerosmith, Inc., USA)*
Dr. Paolo Dabove *(Politecnico di Torino, Italy)*

Conference and Publication Manager

Mrs. Tetyana Zakharchenko *(IFSA Publishing, S.L., Spain)*

Conferences' web sites:

http://www.seia-conference.com
&
http://www.iftc-conference.com

Keynote & Invited Speakers

Dr. Pavel Shuk
Distinguished Technologist
Rosemount Measurements and Analytical
Emerson Automation Solution, Emerson Electric
Corp., Shakopee, MN, USA

Oxygen Gas Sensing Technologies New Features in Combustion Process

Abstract

Zirconia oxygen gas sensing technology is well known for reliable and interference free oxygen measurements in combustion environment. Less known new zirconia oxygen sensor features like humidity or stoichiometric are already implemented on the market and new carbon monoxide (CO) breakthrough measurement are discussed in details. These new features are extending zirconia oxygen analyzer applications and making combustion control more reliable and efficient.

Short Biography:

D. Sc. Pavel Shuk is a Distinguished Technologist at Rosemount Measurement and Analytical (Emerson Process Management, Emerson Electric Corp, Shakopee, MN, USA). He graduated with a first-class honor BS and MS degrees in Physical Chemistry ('summa cum laude') from Belarus State University, Minsk and completed his Ph. D with 'magna cum laude' in high temperature electrochemistry with Prof. Hans-Heinrich Möbius, inventor of zirconia oxygen technology, at *Ernst-Moritz-Arndt* University of Greifswald (Germany). He obtained his D. Scfrom Greifswald University (Germany) for "Contribution to noble metal free electrochemical cells development" and was in 1992-93 Humboldt Fellow with Prof. Wolfgang Göpel in Center for Interface Analysis and Sensors at Eberhard Karls University of Tübingen (Germany). Since 1999 he is with Rosemount Measurements and Analytical, Emerson Automation Solution (USA), world leader in analytical instrumentation, working on the new advanced gas sensor products R & D for the combustion process and new gas sensing technologies evaluation. He developed many new solid state advanced sensors, i.e., CO_2-, CO-, O_2-, pH- and high temperature humidity sensor. Pavel Shuk has published over 125 peer reviewed papers, 19 patents, 7 books chapters and a book on chemical sensors, 39 special reports. D. Sc. Pavel Shuk is a member of the Editorial Board of *J. Solid State Electrochemistry* (Springer).

Dr. Simona M. Cristescu
Radboud University, Institute for Molecules and Materials, The Netherlands

Laser-based Gas Sensors for Breath Analysis: from Research to the Clinic

Abstract

Detection and analysis of volatile compounds in exhaled breath is an attractive tool for monitoring the metabolic status of a patient and disease diagnosis, since it is non-invasive and fast. Several breath-analysis methods are currently available, ranging from mass spectrometry to laser-based spectroscopy and sensor arrays. This talk presents the current status of laser-based methods for clinical breath gas analysis and describes recent technological developments and their applications. A SWOT analysis (strengths, weaknesses, opportunities and threats) is placing the laser-based techniques in the clinical framework of breath research.

Short Biography:

Dr. Simona M. Cristescu received her Ph.D. in physics (cum laude) in 1999 and is currently leading the Exhaled Biomarkes group at Department of Molecular and Laser Physics at Radboud University, Nijmegen, the Netherlands. Her research includes development and implementation of state-of-the-art laser-based spectroscopic methods for real-time detection and identification of gasses relevant for (bio) medical sciences. Several mass spectrometry-based techniques (PTR-MS, GC-MS, GC-IMS) are complementing the optical techniques for multispecies chemical analysis. The main goal is to search for signatures of metabolic processes in the human body reflected in exhaled breath and unravel their mechanisms of action. She published over 120 peer-reviewed articles (h=32), has given > 90 presentations at international meetings and co-supervised completion of 11 PhD theses.

Dr. Carlos Ruiz Zamarreño
Institute of Smart Cities (ISC),
Public University of Navarra, Spain

Label-free Optical Fiber Sensing Platform Based on Lossy Mode Resonances

Abstract

Lossy-mode resonance (LMR)–based optical fiber devices, with a sensitivity comparable to surface plasmon resonance (SPR)-base devices, have emerged as a versatile tool for many applications since the first experimental demonstration in 2009. In contrast to surface plasmon resonances (SPR), generated by transverse magnetic (TM) light, LMRs can be generated with transverse electric (TE) and TM light. Contrary to SPRs that are typically generated by metallic thin-films (gold and silver), semiconducting and dielectric materials can support LMRs, which broadens the range of applications and simplifies some chemistry processes. All in all, the study and optimization of LMR-based optical fiber devices is still at its infancy and presents a promising future for the development of versatile and highly sensitive tools as well as for the utilization of these devices as a label-free sensing platform suitable to be used in many different applications, such as industry, biology, chemical or environmental among others.

Short Biography:

C. R. Zamarreño obtained his PhD in Communications from the Public University of Navarra (UPNA) in 2009, in 2012 he gained a Permanent position as Associate Professor at the UPNA and he has been working as visiting scientist at the MIT, Siemens, and UTFPR in 2008, 2011, 2013 and 2016 respectively. In 2013 he received the IEEE GOLD Award for his contributions to the development of novel optical sensing waveguides based on micro and nanostructured films where he has coauthored more than 100 scientific papers, most of them related to optical sensors based on Lossy Mode Resonances. He has also participated in 20 different research projects and is a co-founder of the spin-off company PYROISTECH.

Prof. José Miguel Dias Pereira
*Polytechnic Institute of Setúbal,
Portugal*

A/D Conversion Techniques Based on the Usage of Pulse Width Modulated (PWM) Signals: Applications for Digital Sensors and Sensor Systems

Abstract

Analog-to-digital conversion plays a central role in any application for digital sensors and sensor systems that require an interface between analog devices, namely analog sensors, and digital devices, namely microprocessors, digital signal processors or microcontrollers. With the advent of smart sensing, the integration of signal conditioning, analog-to-digital and digital data processing in single hardware devices became a reality. Moreover, the usage of low-cost discrete A/D conversion techniques for applications that are not critic in terms of accuracy, resolution and conversion rate, are considering increasingly mixed hardware and software A/D solutions tailored for specific demands. In this context, this presentation introduces a low-cost A/D conversion solution based on pulse width modulation particularly suited for microcontrollers' integration. Advantages of the proposed A/D conversion solution, in terms of analog channels' linearization and calibration, are underlined and experimental study cases are presented.

Short Biography:

J. M. Dias Pereira was born in Portugal in 1959. He received his degrees in Electrical Engineering from the Instituto Superiaor Técnico (IST) of the Technical University of Lisbon in 1982. In 1995 he received the MSc degree, in 1999 – PhD degree, and in 2008 he was approved by unanimity in the Aggregation proofs. All the academic degrees the he obtained are in the area of Electrical Engineering and Computer Science and sub-area of Instrumentation and Measurements. Dr. Pereira is the Principal Coordinator Professor of the Polytechnic Institute of Setúbal, Portugal. He has published over 220 articles in journals and conference proceedings, 1 book and 14 book chapters, and is a co-inventor of 3 patents. He gives its best contribution to IEEE as an author, reviewer, in the past, as co-editor-in-Chief of *IEEE Instrumentation & Measurement* magazine and nowadays as an Associated Editor of *IEEE Transactions on Instrumentation and Measurements.*

Dr. Dan Mihai Stefanescu
Romanian Measurement Society
Romania

Strain Gauges and Wheatstone Bridges in Multicomponent Force and Moment Transducers: On Current Concepts and Applications

Abstract

Did you know that apart from resistive strain gauge there exist also capacitive, magnetoelastic, piezoelectric, SAW (surface acoustic wave) and optical (Bragg grating or Fabry-Perot cavity) ? The original Wheatstone bridge was a group of four resistors connected in a bridge configuration, with a DC voltage supply in one of the diagonals and a null detector in another. Later on, this concept was extended to other bridge topologies: differential transformer (LVDT), magnetoresistive "bridge", galvanomagnetic transducer (Hall-effect), and biparametric (R – L or L – C) half-bridge. Strain gauges and Wheatstone bridge represent the most wide-spread combination in achieving force transducers. One can take over from the finite elements programs the colour code for stressing elastic elements (red for tension and blue for compression) and adapt it to the bridge resistances (increasing and, respectively, decreasing). Did you think that in connection with multicomponent force and moment transducers there are certain confusions in terminology (sensor with transducer, torque with moment) and a rule is not established for the coordinate axes representation (e.g. the "right hand grip rule")? All these aspects will be discussed, starting with examples from materials testing, robotics, aerodynamic balances for wind tunnels, and biomedical applications (TensoDentar equipment for virtual instrumentation).

Short Biography:

Dan Mihai Ştefănescu was born in Bucharest, 6 April 1946. BS in Applied Electronics (1969), MS in Experimental Stress Analysis (1983) and PhD cum laude in Electrical Engineering (1999), all from the 'Politehnica' University of Bucharest. Senior Researcher in Measurement Techniques with the National Institute for Aerospace Research in Bucharest (1969 – 2003). NATO grant at Twente University of Enschede, The Netherlands (2002). Visiting Scientist within Korean Research Institute of Standards and Science, conducting a project on Force Transducers Optimization by Numerical Methods (2004) and then within Center for

Measurement Standards in Taiwan, R.O.C., leading a project on Improved Portable Truck Scales (2005). Now is Senior Consultant for the Romanian Measurement Society. Member of Verband Deutscher Electrotechniker (1987), Romanian representative in IMEKO from 1988 and member of the General Council (2015).

Welcome Cocktail

24 September 2019, Tuesday (19:00-21:00). The Welcome Cocktail will take place in the 16th floor (Sky Lounge Bar) situate on the Hard Rock Hotel's Nirvana Tower building's roof with the best, magnificent, panoramic views to Teide volcano, the Atlantic coast, La Gomera Island and sunset. Actually, it is known as the highest leisure location in Tenerife. Do not miss this opportunity to say the first "hello" to attendees and committee members.

Please do not forget to collect your badge (ID tag) at the registration desk before the Welcome Cocktail. The registration desk will be opened in the Hard Rock Hotel Convention Center (Oasis bulding) near the Wembley I, II conference rooms from 17:00 to 18:00.

Gala Dinner

26 September 2019 (20:00-24:00). The Gala Dinner (BBQ) will take place in the Hard Rock Hotel at the sea beach in front of the Lagoon area (see the map at the end of this Conference Programme brochure).

Sponsors and Media Partners:

Programme at Glance

Day 1: 25 September 2019, Wednesday

Time / Room	Room Wembley I	Room Wembley II
8:45-9:00	Registration (8:45 to 18:00)	
9:00-9:30	[1] Opening Session	
9:30-10:15	Keynote presentation: *Oxygen Gas Sensing Technologies New Features in Combustion Process (Dr. Pavel Shuck, USA)*	
10:15-11:00	Keynote presentation: *Laser-based Gas Sensors for Breath Analysis: from Research to the Clinic (Dr. Simona M. Cristescu, The Netherlands)*	
11:00-11:30	*Coffee Break*	
	Parallel Sessions:	
11:30-13:30	Special Session: *Gas Sensors I*	Session: Physical Sensors & Measurements I
13:30-14:30	*Lunch on your own*	
	Parallel Sessions:	
14:30-16:30	Special Session: *Gas Sensors II*	Session Physical Sensors & Measurements II
16:30-17:00	*Coffee Break*	
17:00-18:00	*Panel Discussion:* *Sensor Community: which services do we need ?* Panelists: S. Y. Yurish, P. Shuk, S. M. Cristescu, D. M. Stefanescu, C. Ruiz Zamarreño and J. M. Dias Pereira	

[1] The must attend session.

Day 2: 26 September 2019, Thursday

Time / Room	Room Wembley I	Room Wembley II
8:45-9:15	Registration (8:45 to 18:00)	
9:15-9:30	[1] Daily Notifications	
9:30-10:15	Keynote presentation: *Strain Gauges and Wheatstone Bridges in Multicomponent Force and Moment Transducers: On Current Concepts and Applications (Dr. Dan Mihai Stefanescu, Romania)*	
10:15-11:00	Keynote presentation: *Label-free Optical Fiber Sensing Platform Based on Lossy Mode Resonances (Dr. Carlos Ruiz Zamarreño, Spain)*	
11:00-11:30	*Coffee Break*	
	Parallel Sessions:	
11:30-13:30	Special Session: *IoT: Sensors, Networks and Applications I*	Session: *Sensor Applications*
13:30-14:30	*Lunch on your own*	
	Parallel Sessions:	
14:30-16:30	Session: *IoT: Sensors, Networks and Applications II*	Session: *Optical Sensors*
16:30-17:00	*Coffee Break*	
17:00-18:40	Session: Biosensors	Session: Fiber Optical Sensors & Optical Systems
18:40-20:00	___	___
20:00-24:00	*Gala Dinner (BBQ),* Hard Rock Hotel, at the sea beach in front of the Lagoon area (see the venue location map at the end of this brochure)	

[1] The must attend session.

Day 3: 27 September 2019, Friday

Time / Room	Room Wembley I	Room Wembley II
8:45-9:15	Registration (8:45 to 13:00)	
9:15-9:30	[1] Daily Notifications	
9:30-10:00	Keynote presentation: *A/D Conversion Techniques Based on the Usage of Pulse Width Modulated (PWM) Signals: Applications for Digital Sensors and Sensor Systems (Dr. Prof. José Miguel Dias Pereira)*	
10:00-10:30	*Coffee Break*	
	Parallel Sessions:	
10:30-13:30	IFTC Session: *Frequency & Time*	Session: *Environmental Measurements & Remote Sensing*
13:30-14:30	*Lunch on your own*	
	Parallel Sessions:	
14:30-16:30	Special Session: *New Trends in Measurement Science: Intelligent Measurements*	⎯⎯
16:30:17:30	*Poster Session, Coffee Break & Farewell Party* (Room Wembley II)	
17:30-18:00	[2] *Closing Session* (Room Wembley I+II)	

[1, 2] The must attend sessions.

Technical Conference Programme

Day 1
25 September 2019, Wednesday

Special Session: Gas Sensors I
(Room Wembley I):

Chairman:
Dr. Pavel Shuk *(Emerson Electric Corp., USA)*

1. **New method for NO/NO$_2$/NH$_3$ measurements and differentiation with a single sensor**
   Boris Farber, Gale Graves, Yang Li, Tyler Rash and Neal Currier (*USA*)

2. **SAW Sensors based on nanoparticles embedded in polymer for VOCs detection**
   Cristian Viespe, Izabela Constantinoiu and Gianina Popescu-PelinRana Biswas and Akshit Peer *(Romania)*

3. **Development of a sensitive and selective mixed-potential ammonia sensor for automotive exhausts**
   Gita Nematbakhsh Abkenar, Jean-Paul Viricelle, Mathilde Rieu and Philippe Breuil *(France)*

4. **Arrays of gas sensing elements based on cerium oxide-tungsten oxide core-shell single-nanowires**
   Ondrej Chmela and Stella Vallejos *(Czech Republic, Spain)*

5. **Sensing Properties of Photo-activated ZnO and ZnO/Au Thin Films**
   Andrea Gaiardo, Barbara Fabbri, Vincenzo Guidi, Pierluigi Bellutti, Matteo Valt, Giancarlo Pepponi, Cesare Malagù, Giulia Zonta and Nicolò Landini *(Italy)*

6. **Observation of CO Detection using Aluminum-doped ZnO Nanorods on Microcantilever**
   Ratno Nuryadi, Lia Aprilia, Makoto Hosoda, Arief Udhiarto, Djoko Hartanto, Mohamad Abdul Barique, Yoichiro Neo and Hidenori Mimura *(Indonesia, Japan)*

7. **Suspended Carbon Nanotubes Gas Sensor**
   Shivaram Arunachalam, Frederic Nabki and Ricardo Izquierdo *(Canada)*

Special Session: Gas Sensors II
(Room Wembley I):

Chairman:

Dr. Simona M. Cristescu *(Radboud University, The Netherlands)*

1. **First step towards a magnetic polymer-based gas sensors**
   Beatriz Lopez-Walle, Jesus Bravo-Guerra, Sara Gomez-Flores
   and Edgar Reyes-Melo *(Mexico)*

2. **Silver nanoparticle-modified polypyrrole Love wave sensors sensitive to acetone**
   Milena Setka and Stella Vallejos *(Czech Republic, Spain)*

3. **AlN nanopowder for biological and optical oxygen gas sensors**
   Baiba Berzina, Laima Trinkler and Valdis Korsaks *(Latvia)*

4. **Polyaniline nano-composites based sensor for simultaneous and selective measurement of ammonium nitrate aerosol and ammonia gas**
   Mohamed Lamine Boukhenane, Nathalie Redon, Jean-Luc Wojkiewicz
   and Patrice Coddeville *(France)*

5. **Rapid strain differentiation of E. coli-inoculated urine using olfactory-based smart sensors**
   Aminat Adebiyi, Nam Than, Sarath Swaminathan, Mohammed Abdi, Amy N. Bowers, Andrea Fasoli, Alberto Mannari and Luisa Bozano *(USA)*

6. **Detection level of honeybee disease: Varroosis using a gas sensor array**
   Andrzej Szczurek, Monika Maciejewska, Beata Bąk, Jakub Wilk, Jerzy Wilde
   and Maciej Siuda *(Poland)*

Session: Physical Sensors & Measurements I
(Room Wembley II):

Chairman:

Dr. Yoshiaki Kogure *(Teikyo University of Science, Japan)*

1. **Novel integrated magnetic sensor based on Hall element**
   Janez Trontelj, Damjan Bercan and Miha Gradisek *(Slovenia)*

2. **Noise analysis of PCB-based, double-core planar fluxgate sensor**
   Michael Ortner, Ali Roshanghias, Martin Lenzhofer and Tarcis Becher
   (Austria)

3. **Ultrasonic temperature measurement**
   Michael Reisinger, Michael Schwarz and Bernhard Zagar *(Austria)*

4. **A multivariate emissivity database for industrial infrared radiation thermometry**
   Eleanor Chalkley *(UK)*

5. **Ultrasonic flow meter for leakage detection in water mains**
   Franz Huber, Michael Schwarz and Bernhard Zagar *(Austria)*

6. **Microfabricated thermal flow rate sensor**
   Bilel Neji *(Kuweit)*

7. **Continuous sorting of submicron particles in a pre-analytical device based on acousto-fluidic microsystem**
   Amar Chaalane, Daniel Guneysu, Mahmoud Addouche, Rabah Zeggari, Franck Lardet-Vieudrin, Celine Elie-Caille, Wilfrid Boireau and Abdelkrim Khelif *(France)*

Session: Physical Sensors & Measurements II (Room Wembley II):

Chairman:

Dr. Eleanor Chalkley *(University of Strathclyde, UK)*

1. **Differential pressure sensing based on phase sensitive detection for liquid level measurement**
   Parisa Esmaili, Federico Cavedo and Michele Norgia *(Italy)*

2. **Effect of thin film interconnect inelasticity on MEMS pressure sensor hysteresis**
   Youssef Hamid, David Hutt and David Whalley *(UK)*

3. **Simulation of crystallization and mechanical properties of Ge thin film for flexible sensor in communication devices**
   Yoshiaki Kogure, Tomoko Funayama and Yasutaka Uchida *(Japan)*

4. **Direct sensing of time-varying displacement in nanopositioners by piezoelectric ceramics transducers**
   Ali Bazaei, Mokrane Boudaoud, Massoud Hemmasian Ettefagh, Zhiyong Chen and Stephane Régnier *(Australia, France, Iran)*

5. **Pulse shape dependence on applied voltage of Geiger-Mueller detector**
   Bader Almutairi *(USA)*

6. **Low Frequency Hydrophone for Marine Seismic Exploration Systems**
   Egor Egorov, Anna Shabalina, Dmitry Zaitsev and Grigory Velichko *(Russia)*

Day 2
26 September 2019, Thursday

Special Session: IoT: Sensors, Networks and Applications I (Room Wembley I):

Chairman:
Dr. Michal Hodon *(University of Zilina, Slovakia)*

1. **A flexible acoustic sensing system and its application to IoT - manufacturing field site**
   Yasutaka Serizawa and Yusuke Shomura *(USA)*

2. **Message compression concept for software defined IoT edge devices**
   Rainer Poeschl and Alexander Faschingbauer *(Germany)*

3. **Raw-LoRa vs. LoRaWAN for urban monitoring: two wireless sensor network architectures in comparison**
   Stefano Tondini, Simone Tritini, Silvia Croce, Stefano Seppi and Roberto Monsorno *(Italy)*

4. **Adaptable power consumption profiles for wearable localization devices**
   Manuel Faustino, Jorge Calado, João Sarraipa and Ricardo Jardim-Gonçalves *(Portugal)*

5. **Concept for detection of device failures using active grid analysis**
   Alexander Faschingbauer and Christina Sigl *(Germany)*

6. **Communication anomaly detection in cyber-physical systems**
   P. Blazek, R. Fujdiak, M. Hodon, I. Zolotova, P. Mlynek and J. Misurec
   (Czech Republic, Slovakia)

Special Session: IoT: Sensors, Networks and Applications II (Room Wembley I):

Chairman:

Dr. Yasutaka Serizawa *(Hitachi America Ltd., IoT Edge Laboratory, USA)*

1. **A performance analysis framework for IoT wireless sensor networks**
   <u>Martin Húdik</u>, Lukáš Formánek and Štefan Toth *(Slovakia)*

2. **Dynamic system parameter identification based on the acceleration data**
   <u>Peter Šarafín</u> and Robert Zalman *(Slovakia)*

3. **Compressed sensing and acoustic analysis for use in WSN localization tasks**
   <u>Veronika Olešnaníková</u>, Ondrej Karpis, Lukas Formanek and Miroslav Chochul *(Slovakia)*

4. **Prediction of temperature in WSN using artificial intelligence**
   <u>Lukáš Formanek</u>, Miroslav Chochul and Ondrej Karpiš *(Slovakia)*

5. **An overview of magnetometer sensors performance for the purposes of traffic flow monitoring**
   <u>Michal Hodoň</u>, Peter Ševčík, Ondrej Karpiš and Juraj Miček *(Slovakia)*

Session: Biosensors (Room Wembley I):

Chairman:

Dr. Aleksandra Lobnik *(University of Maribor, Slovenia)*

1. **Ultra-high-frequency surface-acoustic-wave lab-on-chip for the detection of the glial-fibrillary-acidic-protein biomarker**
   <u>Matteo Agostini</u>, Gina Greco, Maria Laura Vieri, Francesco Amato and Marco Cecchini *(Italy)*

2. **Portable bioimpedance device and monitoring of hydration in a healthy person before and after exercise**
   <u>Vladimir Leonov</u>, Mario Konijnenburg, Hyunsoo Ha, Bernard Grundlehner and Nick Van Helleputte *(Belgium, The Netherlands)*

3. **Lung volumes and ventilation assessment using multifrequency bioimpedance meter**
   Vladimir Leonov and Hyunsoo Ha *(Belgium, The Netherlands)*

4. **Biofluorometric gas-imaging system (Sniff-cam) for body volatiles**
   Kenta Iitani, Koji Toma, Takahiro Arakawa and Kohji Mitsubayashi *(Japan)*

5. **Possibility for temporal observation of thrombus generated in extracorporeal circulator circuit by photoacoustic imaging using LED**
   Takahiro Wabe, Ryo Suzuki and Yasutaka Uchida *(Japan)*

Session: Sensor Applications
(Room Wembley II):

Chairman:

Dr. Dan Mihai Stefanescu *(Romanian Measurement Society, Romania)*

1. **SVM classification to data obtained from health condition change monitoring system using flexible force sensing resistors**
   Yasutaka Uchida, Tomoko Funayama and Yoshiaki Kogure *(Japan)*

2. **Measurement system development for geotechnical monitoring**
   Martin Pies and Radovan Hajovsky *(Czech Republic)*

3. **Invisible sensors for early prediction of discontinuous bed-leaving behavior patterns**
   Hirokazu Madokoro, Kazuhisa Nakasho, Nobuhiro Shimoi, Woo Hanwool and Kazuhito Sato *(Japan)*

4. **Two magnetic polymer minirobots for aquatic operation**
   Edgar Reyes-Melo, Liliana Miranda Vazquez, Beatriz Lopez-Walle, Sergio Zapata-Reyes and Jair Cisneros-Hinojosa *(Mexico)*

5. **Development and mathematical description of a bistable hydrogel-based sensor switch for monitoring of the relative humidity**
   Nikolai Gulnizkij and Gerald Gerlach *(Germany)*

6. **Extending bee hive health state monitoring by integrated acoustical sensing and machine learning**
   Andreas Koenig *(Germany)*

Session: Optical Sensors
(Room Wembley II):

Chairman:
Dr. Ulrich Fischer-Hirchert *(Harz University of Applied Sciences, Germany)*

1. **Microfiber/SiC-nanowire coupler for all-optical UV photodetection**
   Ying Wang and Changrui Liao *(China)*

2. **Optical back-reflecting sensor based on vertical grating coupler configuration**
   Anat Demeter-Finzi and Shlomo Ruschin *(Israel)*

3. **Monolithic integrated PIN photodiode study with backend stack optimization**
   Ingrid Jonak-Auer, Frederic Roger and Olesia Synooka *(Austria)*

4. **Effect of the channel length in the response of a MIS transistor sensor with optical gain for nano-watts light signal**
   Joaquín Hernández-Betanzos, Mariano Aceves-Mijares, Alfredo A. González-Fernández and Jorge Pedraza *(Mexico)*

5. **Optical chemical sensors for biogenic amines and biothiols**
   Aleksandra Lobnik, Polonca Nedeljko, Tinkara Mastnak and Andreja Gutmaher *(Slovenia)*

Session: Fiber Optical Sensors & Optical Systems
(Room Wembley II):

Chairman:
Dr. Carlos Ruiz Zamarreño *(Public University of Navarra, Spain)*

1. **On-Fiber polymer whispering gallery mode resonator microprinted by femtosecond laser**
   Changrui Liao, Lei Xu and Ying Wang *(China)*

2. **Optical sensor systems with micro-structured grating in PMMA for POF-applications**
   Ulrich Fischer-Hirchert, Matthias Haupt and Sebastian Höll *(Germany)*

3. **High-temperature sensors based on femtosecond laser-inscribed fiber Bragg gratings**
   Jun He, Xizhen Xu, Changrui Liao, Ying Wang and Yiping Wang *(China)*

4. **BaY2F8:Yb3+, Ho3+/ Tm3+ upconversion phosphor for optical thermometer**
   Hendrik C. Swart, Ashwini Kumar and Govind B. Nair *(South Africa)*

5. **Femtosecond laser inscribed tilted in-fiber beam splitter used for reflective Mach-Zehnder interferometer**
   Hua Zhang, Dongning Wang and Chunliu Zhao *(China)*

Day 3
27 September 2019, Friday

IFTC Session: Frequency & Time I (Room Wembley I):

Chairman: Prof. José Miguel Dias Pereira
(Polytechnic Institute of Setúbal, Portugal)

1. **Frequency-analogue working vitality detector**
   Anett Bailleu *(Germany)*

2. **Single crystalline ferroelectric lithium niobate-tantalate Li(Nb,Ta)O₃ solid solutions for high-temperature sensor and actuator applications**
   Dmitry Roshchupkin, Olga Plotitcyna, Eugenii Emelin, Sergey Sakharov and Yurii Suhak *(Russia)*

3. **A low cost ultrasound-based localisation system**
   Alec Burns, Sebastiano Fichera and Paolo Paoletti *(UK)*

4. **Spectral analysis of seismic noise using HVSR technique**
   Michele Paoletti, Roberto Concetti, Paola Pierleoni, Alberto Belli and Lorenzo Palma *(Italy)*

5. **Research on dynamic steering method of atomic clock based on residual correction**
   Yuwei Li, Wenli Wang, Yanrong Xue, Ruiqiong Chen and Ya Liu *(China)*

6. **Multi-epoch time difference positioning in dual-satellite passive location system**
   Yanrong Xue, Yuwei Li, Ruiqiong Chen, Duosheng Fan and Ya Liu *(China)*

7. **Software based sigma-delta converter with auto-calibration capabilities**
   José Dias Pereira *(Portugal)*

Session: Environmental Measurements & Remote Sensing (Room Wembley II):

Chairman:

Prof. Yossi Hayon *(Tell Aviv University, Israel)*

1. **Design and implementation of the embedded system for environmental variables measurement**
   Martin Pies, Radovan Hajovsky and Jan Velicka *(Czech Republic)*

2. **Mobile air quality monitoring system using unmanned aerial vehicles & wireless sensors networks**
   Rosa Maria Camarillo, Jorge Flores, Juana Maria Camarillo, Elizabeeth Hernandez, Juan Antonio Ramirez, Francisco Javier Castro *(Mexico)*

3. **On the fly soil classification using impedance spectroscopy**
   Olga Chambers, Janez Trontelj and Jurij Tasič *(Slovenia)*

4. **A simple method for determination of the frequency response of the constant-temperature hot-wire anemometer**
   Shohei Takagi, Ayumu Inasawa and Masahito Asai *(Japan)*

5. **Analysis of climate and oceanic variables in the Canarian archipelago in the last 15 years through remote sensing**
   Nerea Marrero Betancort, Dionisio Rodríguez Esparragón and Javier Marcello Ruiz *(Spain)*

6. **Correlation between weather conditions and respiratory pathologies in Gran Canaria by the use of remote sensing**
   Isabel María Caballero Leiva, Nerea Marrero Betancort, José Juan Rodriguez Betancor, Dionisio Rodriguez Esparragón and Javier Marcello Ruiz *(Spain)*

Session: New Trends in Measurement Science. Intelligent Measurements (Room Wembley I):

Chairman:
Prof. Svetlana V. Prokopchina *(Financial University, Russia)* & Prof. Valery B. Tarassov *(Bauman Moscow State Technical University, Russia)*

1. **New trends in measurement science. Bayesian intelligent measurement**
   Prokopchina S. V. *(Russia)*

2. **Global measurement as a new trend of measurement science and digital economics**
   Iljin I. V., Prokopchina S. V. *(Russia)*

3. **Financial measurement by the means of Bayesian regularizating approach**
   Dernovoy V. B., Mitshenko S. N. *(Russia)*

4. **The Cognitive Measurement. A new paradigm of measurement science**
   Tarassov V. B. *(Russia)*

5. **The measurement ontology. Towards a system of measurement science ontology**
   Tarassov V. B., Koroleva M. N. *(Russia)*

6. **The methodologies aspects of measurement in Energy and Housing applications**
   Frolov A. , Sheremetjev S. *(Russia)*

Poster Session (Room Wembley II)
27 September (16:30-17:30)

1. **Mechanoluminescent pulse pressure sensors**
   Konstantin Tatmyshevskiy *(Russia)*

2. **High performance of cellulose nanofibers/poly(3,4-ethylenedioxy-thiophene):poly(4-styrenesulfonate)/metal oxide/ionic liquid**
   Naohiro Terasawa *(Japan)*

3. **An ultra-wideband band-pass filter for Cosmic microwave background observations**
   Javier de Miguel-Hernández and Roger J. Hoyland *(Spain)*

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4. **An ion beam guidance control tool proposal**
   Lars Bengtsson *(Sweden)*

5. **Mobile optical sensor system for DOM monitoring in stream ecosystems**
   Thomas Posnicek *(Austria)*

6. **Sensors based on Ion transfer voltammetry across the polarized ionic liquid/water interface**
   Jan Langmaier and Zdenek Samec *(Czech Republic)*

7. **New approach to sensing amphiphilic electrochemically active compounds**
   Tomas Navratil, Jana Skopalova and Andrea Rajcová *(Czech Republic)*

8. **Carbon fiber brush electrode for detection of bioactive compounds transported across biomimetic membranes**
   Jana Skopalova, Daniel Riman, Radek Jerga and Petr Barták
   (Czech Republic)

9. **A study on low latency serial powerline tunnels for sensor data transmission**
   Karlheinz Kellner, Daniel Hochwarter and Martin Brandl *(Austria)*

10. **VarroaCounter – Towards automating the Varroa screening for alleviated bee hive treatment**
    Andreas Koenig *(Germany)*

11. **Development of a new POC platform for cancer biomarkers**
    Ioannis Prattis, Richard Wilson and Luigi Occhipinti *(UK)*

12. **A new amperometric enzyme-based biosensor for specific determination of 17β-estradiol**
    Kamila Spychalska and Joanna Cabaj *(Poland)*

13. **Design and implementation of environment monitoring system based on ZigBee**
    Fuzheng Zhang, Weile Jiang, Qijing Lin and Hao Wu *(China)*

14. **Sapphire optical fiber sensor for ultra-high temperature measurement**
    Na Zhao, Qijing Lin, Zhuangde Jiang, Kun Yao, Bian Tian and Zhongkai Zhang *(China)*

15. **Peculiarities of testing of measurement instrument software in Ukraine**
    Oleh Velychko, Oleh Hrabovskyi and Tetyana Gordiyenko *(Ukraine)*

16. **Estimation of uncertainty in calibration of precision LCR-meters on the state primary standard of units of inductance and tangent angles of losses**
Iurii Kuzmenko, Oleh Velychko, <u>Sergii Shevkun</u> and Maryna Dobrolyubova *(Ukraine)*

17. **High resolution data acquisition and control system for performance monitoring of domestic solar water heaters**
<u>Edson Meyer</u>, Julian Nwodo and Ochuko Overen *(South Africa)*

18. **Secure PUF: Physically unclonable function based on arbiter with enhanced resistance against machine learning attacks**
<u>Mohammed Elhajj</u> *(Lebanon)*

19. **Scanning electron microscopy imaging of acoustic wave fields distribution in QCM**
Dmitry Roshchupkin, <u>Eugenii Emelin</u>, Olga Plotitcyna and Sergey Sakharov *(Russia)*

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Venue location map.

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