Welcome Message

Servus! Welcome to Vienna, and welcome to IEEE SENSORS 2023! After 19 years, the conference is back in the heart of Europe, and on behalf of the organizing committee, we are excited to welcome you to Austria. IEEE SENSORS 2023 will be held from Oct. 29 – Nov. 1, 2023, at the Hilton Vienna Park, just a stone's throw away from the city's historic center.

The IEEE SENSORS conference is a premier platform for researchers, engineers, practitioners, and society leaders from around the world to present and discuss their latest research, ideas, and opinions. This year's edition is special in many respects. First and foremost, it is the climax of the silver jubilee year for IEEE Sensors Council, and we have planned several memorable activities for you. Formally constituted in June 1998 with presidents of 14 IEEE societies the IEEE Sensors Council now serves its 26 IEEE member societies in the multi-disciplinary technical areas of sensors. From design to fabrication and applications, IEEE SENSORS council covers all aspects of sensors and sensing systems.,. The 25 years of service to the Sensors Community has been a remarkable journey with outstanding successes in several areas with impact across the world. We hope to continue this path with the constant support of our member societies and the involvement of the sensors community. Second, we are thrilled to be fully back to a time of no more travel restrictions, and benefiting from face-to-face meetings and networking opportunities. The organizing committee has taken this into account when planning the layout of the conference, the breaks, and most of all the social events which we hope you will enjoy!

This year, we are trying out several innovations to enhance the attendee experience and provide additional opportunities to get involved resulting in the highest ever attendance to IEEE SENSORS. For the first time, we are hosting workshops on the first day together with the tutorials. These workshops are a possibility for organizers to propose their own satellite event, with no formal strings attached. The format is free and can be anything from invited lectures to panel discussions or hands-on interactions with the audience. It is an experiment, and the 5 workshops that have been accepted promise to be exciting. IEEE SENSORS intends to continue this trend in the future. Another innovation concerns the extension of the journal-conference synergy program launched by IEEE Sensors Council last year. Like in 2022, we have invited authors of selected popular articles published recently in the IEEE Sensors Journal to present their work at the conference. In addition, we extended the invitations to authors of articles in the IEEE Sensors Letters. 73 international speakers have accepted our invitation, and 53 will present their works in 12 lecture sessions. This not being enough, we offered two different routes of submission to IEEE SENSORS 2023. The first was the classical conference paper submission, while the second option was to submit directly to IEEE Sensors Letters. From the 212 original and 86 revised submissions during the review process, 120 were ultimately accepted via IEEE Sensors Letters route, and 115 of these will be presented at the conference. You will recognize all of these previously published journal articles in the program by their included DOIs.

Besides the submissions via the IEEE Sensors Letters, we received a total of 870 regular/classic conference submissions (in total 1082 submissions via both classical conference paper submission route and IEEE Sensors Letters route) to the 14 technical tracks, the 4 focused sessions, and the live demonstration track. 482 papers were accepted after a rigorous review process. The submissions came from all over the world, with 41.3% from Europe, 41.8% from Asia/Pacific, 11.7% from North America, 2.2% from Latin America,

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Welcome Message (cont.)

and 3.1% from Middle East/Africa. Taking everything together, IEEE SENSORS 2023 features 319 lectures and 328 poster presentations. 19 of the lectures are invited presentations given by renowned international speakers who were selected in their respective tracks based on their expertise and accomplishments and finally, 42 open posters sharing latest work round off the program.

IEEE SENSORS 2023 features three keynote speakers who are renowned experts with long years of experience in diverse areas of sensing technologies and applications. On Monday, Kimberly Foster from Tulane University, USA, will look at "Nonlinearity and Sensing: a 30 Year Journey". Michael L. Roukes from Caltech, USA, will share with us his thoughts on "NEMS and sensing – from classical to quantum" on Tuesday. Finally, on Wednesday, Archana Sharma from CERN will present her talk on "Secrets of the universe, technological advances and why should I care!"

This year, we have also put more emphasis on industry involvement, reflecting a general strategy of the IEEE Sensors Council, which emphasizes greater engagement with industry. As a result, we have 16 exhibitors, an Industry Track session on Monday, and an industry-organized workshop on electronic skin patches on Tuesday. And there is more waiting for you to learn and network: On Sunday, 9 tutorials will be offered in parallel with the workshops. The Young Professionals (YP) Committee has organized a reception and poster session at the general welcome reception on Sunday, and a panel discussion on Monday. The Women in Sensors (WiSe) committee invites you to their speaker session on Monday and a networking lunch on Wednesday. Continuing last year's success, YP and WiSe have come together to sponsor the Big Idea Pitch competition on Wednesday, which is aimed to motivate young students and researchers to pursue business ideas based on their research and learn from coaches and judges how to pitch their visions. Furthermore, WiSe has organized a Mentor/Mentee session during Lunch on Tuesday. On Sunday, we will have a special session on research funding with speakers from the European Research Council and the US National Science Foundation. Last but not least, on Wednesday, conference participants have the opportunity to meet and discuss with Editors-in-Chief of Sensors Council sponsored journals, including IEEE Sensors Journal, IEEE Sensors Letters, IEEE Journal of Selected Areas in Sensors, IEEE Internet of Things Journal, and IEEE Journal on Flexible Electronics.

A conference is unthinkable without social events. This year's welcome reception will be held on Sunday in the Vienna City Hall, a magnificent neo-gothic building at the Ringstrasse, Vienna's famous boulevard around the city center. Supported by the Vienna City Council, we will enjoy not only the splendor of the festive hall, but also a selection of Austrian and especially Viennese food and wine. The highlight of the conference will undeniably be the IEEE Sensors Council's 25th Anniversary Ball on Tuesday. We also be joined by the Presidents of Sensors Council's member societies, or their representatives and distinguished guests from IEEE. As a culmination point of its jubilee year, the IEEE Sensors Council invites us to a memorable night at the Hofburg. Vienna's Royal Palace in the city center is a place where history has been made throughout the centuries, and it still is the venue for splendid gala events and many of the more than 400 annual balls in Vienna. Bring your dancing shoes, and join us in what the Viennese ball tradition stands for: socializing, networking, and enjoying life!

Sustainability is a main concern not only of our time, but also a theme of IEEE SENSORS 2023. This aligns with IEEE Sensors Council's 25th Anniversary theme, i.e., 'Sensors for Sustainable Future'. There are several sessions in the program revolving around sensors and sensor applications for the environment, and also the 25th Anniversary session on Tuesday will be devoted to this topic. In addition, the entire conference is organized as a Green Meeting according to the requirements of the Austrian Ecolabel, which means that we prevent waste, use recyclable products, employ environmentally friendly travel options, and use regional sources of ingredients for catering.

Welcome Message (cont.)

Organizing a conference like IEEE SENSORS 2023 is a collaborative effort of many people working together over a long time. In our case, the IEEE SENSORS 2023 journey has started in 2019, long before the pandemic, and has become increasingly intense in the last year. We are grateful to all the organizing committee and program committee members for volunteering and devoting their time to prepare the conference. And of course we thank you, the authors and participants, for coming to Vienna and sharing your work and ideas with us. Let us enjoy the time together!

Thilo Sauter
General Co-Chair
IEEE SENSORS 2023

Ravinder Dahiya
General Co-Chair
IEEE SENSORS 2023

Bernhard Jakoby
Technical Program Co-Chair
IEEE SENSORS 2023

Jeong Bong (JB) Lee
Technical Program Co-Chair
IEEE SENSORS 2023

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Ravinder Dahiya, *Northeastern University, Boston, USA*

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Calogero Maria Oddo, *School of Advanced Studies, Pisa, Italy*

Publicity Chair

John Vig, *Sensors Council VP Conferences, USA*

Track Chairs

Track 1: Sensor Phenomenology, Modeling and Evaluation
Tarikul Islam, *Jamia Millia Islamia (Central University), India*
Tao Li, *University of Cincinnati, USA*

Track 2: Sensor Materials, Fabrication and Packaging
Ulrich Schmid, *TU Wien, Austria*
Arum Han, *Texas A&M University, USA*

Track 3: Chemical, Electrochemical and Gas Sensors
Xiaoshan Zhu, *University of Nevada Reno, USA*
Hamida Hallil, *Bordeaux University, France*

Track 4: Microfluidics and Biosensors
Uwe Schnakenberg, *RWTH Aachen Unversity, Germany*
Hyejin Moon, *University of Texas at Arlington, USA*

Track 5: Optical Sensors
Cristian Manzoni, *Polytecnico Milano, Italy*
Rona Chandrawati, *University of New South Wales (UNSW Sydney), Australia*

Track 6: Physical Sensors: Temperature, Mechanical, Magnetic and Others
Siavash Pourkamali, *University of Texas at Dallas, USA*
Dong-Weon Lee, *Chonnam National University, Korea*

Track 7: Acoustic and Ultrasonic Sensors
Haifeng Zhang, *University of North Texas, USA*
Hongyu Yu, *Hong Kong University of Science and Technology, China*

Track 8: Sensor Networks and IOT
Yacine Ghamri-Doudane, *La Rochelle University, France*
Domenico Balsamo, *Newcastle University, UK*

Track 9: Emerging Sensor Technologies and Applications
Mark Cheng, *The University of Alabama, USA*
Joost Lötters, *University of Twente & TU Delft, The Netherlands*

Track 10: Sensor Systems: Signals, Processing and Interfaces
Sara Moccia, *School of Advanced Studies, Pisa, Italy*
Changhee Won, *Temple University, USA*

Track 11: Actuators, Energy Harvesting and Powering Sensors
Smitha Rao Hatti, *Michigan Technological University, USA*
Hongsoo Choi, *Daegu Gyeongbuk Institute of Science and Technology, Korea*

Track 12: Sensor Data Processing
Marco Jose da Silva, *Johannes Kepler Unversity Linz, Austria*
Chao Tan, *Tianjin University, China*

Track Chairs (cont.)

Track 13: Wearable Sensors and Systems
Jürgen Kosel, *Silicon Austria Labs, Austria*
Sahika Inal, *King Abdullah University of Science and Technology, Saudi Arabia*

Track 14: Sensors in Industrial Practices
Stephen F. Bart, *TDK InvenSense, USA*
Amit Kumar, *BioAxis DNA Research Centre, Hyderabad, India*

Track 15: Live Demonstration of Sensors and Sensing Technologies
Calogero Maria Oddo, *School of Advanced Studies, Pisa, Italy*
Anna Grazia Mignani, *CNR-Istituto di Fisica Applicata "Nello Carrara", Italy*

Track 16.1 Focused Session: Sensor Technologies for Sustainable Development
Sofia Sandhu, *University of Glasgow, UK*
Shawana Tabassum, *The University of Texas at Tyler, USA*

Track 16.2 Focused Session: Bio-Remote Sensing and Integrated Artificial Intelligence Systems
Kianoush Rassels, *TU-Delft, The Netherlands*
Paddy French, *TU-Delft, The Netherlands*

Track 16.3 Focused Session: Chemical Agent Detection: Sensing Technologies and Sensor Applications
Arne Ficks, *Bundeswehr Research Institute for Protective Technologies and CBRN-Protection, Germany*
Maria Allers, *Bundeswehr Research Institute for Protective Technologies and CBRN-Protection, Germany*

Track 16.4 Focused Session: Smart Biomedical Sensor Platforms in Resource-Constrained Settings
Shantanu Bhattacharya, *Indian Institute of Technology Kanpur, India*
Siddharth Tallur, *IIT Bombay, India*
Andrew Ward, *University of Strathclyde, UK*

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Vice President – Conferences (2022-2023)
John Vig, *Consultant, Colts Neck, NJ USA*

Vice President – Technical Operations (2022-2023)
Anil K. Roy, *DA-IICT, India*

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Chonggang Wang, *InterDigital Communications, USA*

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Distinguished Lecturer Program Chair
Anil K. Roy, *DA-IICT, India*

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IEEE Fellows Committee Chair
Sandro Carrara, *EPFL, Lausanne, Switzerland*

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John Vig, *Consultant, USA*

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IEEE Sensors Council EXCOM & ADCOM (cont.)

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IEEE SENSORS COUNCIL EXCOM & ADCOM (CONT.)

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IEEE Sensors Journal Editor-in-Chief
Sandro Carrara, *EPFL Lausanne, Switzerland*

IEEE Sensors Letters Editor-in-Chief
Andrei Shkel, *University of California, Irvine, CA USA*

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Conference Manager
Caroline Kravec, *Conference Catalysts, LLC, USA*

Technical Program Papers Support
Tom Wehner, *ePapers, USA*

IEEE Sensors Council EXCOM & ADCOM (cont.)

Sensors Council Appointments to Other Organizations

IEEE TAB Finance corresponding member	Srinivas Tadigadapa	Northeastern University, Boston, MA, USA
IEEE TAB Conference Publications Committee corresponding member	John Vig	Consultant, Colts Neck, NJ USA
IEEE TAB/PSPB Products and Services corresponding member	Krikor Ozanyan	University of Manchester
IEEE TAB Periodicals Committee corresponding member	Krikor Ozanyan	University of Manchester
IEEE TAB Awards and Recognition Committee corresponding member	Fabrice Labeabu	McGill University, Montreal, Canada
IEEE TAB Strategic Planning Committee corresponding member	Ravinder Dahiya	Northeastern University, Boston, MA, USA
IEEE TAB Committee on Technical Community Outreach, Engagement, and Society Membership corresponding member	Deepak Uttamchandani	University of Strathclyde Glasgow, UK
SmartGrid representative	Kim Kiseon	Kwangiu Institute of Science and Technology, South Korea
IEEE USA Government Relations – Medical Technology Policy	Mike McShane	Texas A&M University College Station, TX, USA
IEEE USA Government Relations – Intellectual Property Committee	Vladimir Lumelsky	University of Wisconsin, Madison, WI 53706
IEEE USA Government Relations – Committee on Transportation and Aerospace Policy	Chris Schober	Honeywell, Inc. Minneapolis, MN USA
History Committee corresponding member appointee	John Vig	Consultant, Colts Neck, NJ, USA
IEEE USA Government Relations – Committee on Energy Policy	John Vig	Consultant, Colts Neck, NJ, USA
IEEE Cloud Computing Initiative (CCI)	Mahmoud Daneshmand	Stevens Institute of Technology, Hoboken, New Jersey, USA
IEEE Transactions on GAMES	Ricardo Gutierrez; Paul Chao; Gianluca Lazzi; Mike McShane	

IEEE Sensors Council EXCOM & ADCOM (cont.)

Life AdCom Members

Christina M. Schober, *Honeywell, Inc, USA*
John Vig, *Consultant, USA*
H. Troy Nagle, Electrical and Computer Engineering NC State University, USA
Vladimir Lumelsky, University of Wisconsin, USA

Senior AdCom Members-at-Large

Zeynep Celik - Senior MaL (2023-2024) - *University of Texas at Arlington, USA*
Krikor B. Ozanyan - Senior MaL (2023-2024) - *University of Manchester, United Kingdom*
Christina M. Schober - Senior MaL (2022-2023) - *Honeywell, Inc., USA*

AdCom Members-at-Large

Hamida Hallil - Member-at-Large (2023-2024) - *University of Bordeaux, France*
Ignacio Matias - Member-at-Large (2022-2023) - *Institute of Smart Cities Public University of Navarre, Spain*
Hadi Heidari - *Member-at-Large (2022-2023) - University of Glasgow, UK*
Saakshi Dhanekar - *Member-at-Large (2022-2023) - Indian Institute of Technology (IIT), India*
Stoyan Nihtianov - *Member-at-Large (2022-2023) - TU Delft, The Netherlands*
Marco Jose da Silva - *Member-at-Large (2022-2023) - Federal University of Technology – Parana, Brazil*

IEEE Sensors Council EXCOM & ADCOM (cont.)

Member Society	Name	Affiliation
Aerospace and Electronic Systems	Paola Andrea Escobari Vargas	Bolivian Space Agency, Bolivia
Antennas and Propagation	Jiro Hirokawa	Tokyo Institute of Technology, Japan
Broadcast Technology	Paul Shulins	Burk Technology, Littleton, MA, USA
Circuits and Systems	Danilo Demarchi	Politecnico di Torino, Italy
Communications	Mahmoud Daneshmand	Stevens Institute of Technology, USA
Computer	John Johnson	Deloitte, USA
Consumer Technology	Chih-Peng Fan	National Chung Hsing University, Taiwan
Dielectrics and Electrical Insulation	TBD	
Electromagnetic Compatibility	Chuck Bunting	Oklahoma State University, USA
Electron Devices	Chen Yang	Analog Devices, USA
Electronics Packaging Society	Shafi Saiyed	Analog Devices, Wilmington, MA, USA
Engineering in Medicine and Biology	Emil Jovanov	University of Alabama in Huntsville, AL
Industrial Electronics	Ren Luo	National Taiwan University, Taiwan
Industry Applications	Marco Antônio Dalla Costa	Federal University of Santa Maria, Brazil
Instrumentation and Measurement	Nicola Donato	University of Messina, Italy
Magnetics	Susana Cardoso de Freitas	INESC Microsystems & Nanotechnologies & Instituto Superior Técnico, Universidade de Lisboa, Portugal
Microwave Theory and Technology	TBD	
Oceanic Engineering	Christopher Whitt	JASCO Applied Sciences, Canada
Photonics	Carlos Ruiz Zamarreño	Universidad Pública de Navarra, Spain
Power and Energy	Farnoosh Rahmatian	NuGrid Power Corp, Canada
Reliability Society	Jeff Voas	NIST
Robotics and Automation	Kaspar Althoefer	Queen Mary University of London, UK
Signal Processing	Peter Willett	University of Connecticut, Storrs, CT USA
Solid State Circuits	Dan McGrath	Texas Instruments, Inc.

IEEE Sensors Council EXCOM & ADCOM (cont.)

Ultrasonics, Ferroelectrics and Frequency Control	James Spicer	Johns Hopkins University, Baltimore, MD USA
Vehicular Technology	Thanuka Wickramarathne	University of Massachusetts Lowell

Patrons

GOLD PATRON

SILVER PATRONS

AWARD PATRON

LOCAL PARTNERS

Exhibitors

AMO

ELVE FLOW | MICROFLUIDICS INNOVATION CENTER

FORCE TECHNOLOGY

Fraunhofer FEP

GORE

iROM
MAKING MEMS DESIGN EASY

Solution Provider
KYODO INTERNATIONAL INC.

MEMS
IEEE MEMS TECHNICAL COMMUNITY

NEXTRON
MICRO PROBE SYSTEM

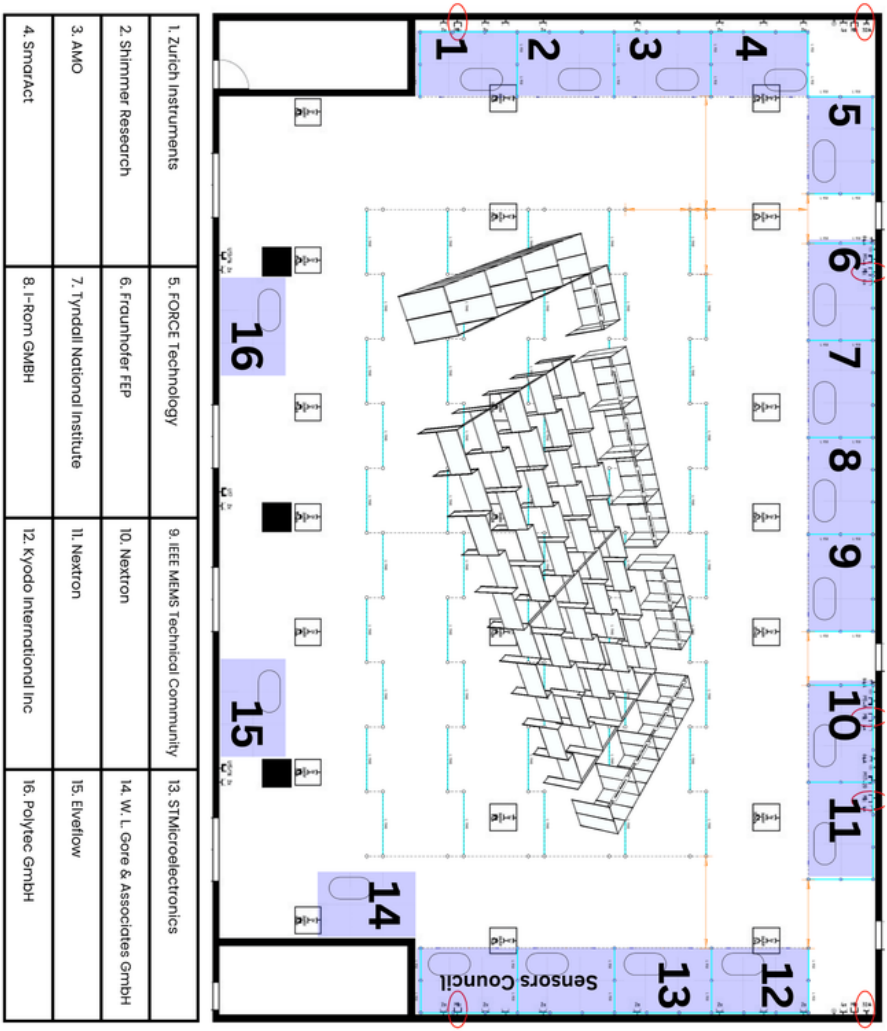
Polytec

shimmer
DISCOVERY IN MOTION

SmarAct

Exhibitors (cont.)

Exhibit Hall Layout



1. Zurich Instruments	5. FORCE Technology	9. IEEE MEMS Technical Community	13. STMicroelectronics
2. Shimmer Research	6. Fraunhofer FEP	10. Nextron	14. W. L. Gore & Associates GmbH
3. AMO	7. Tyndall National Institute	11. Nextron	15. Elveflow
4. SmarAct	8. I-Rom GMBH	12. Kyodo International Inc	16. Polytec GmbH

Exhibit Hall Hours

Monday
- 10:00 – 10:30 | 13:30 – 15:30

Tuesday
- 13:00 – 11:00 | 15:30 – 16:00

Wednesday
- 10:00 – 10:30 | 13:30 – 15:00

Venue Map

Ground Floor

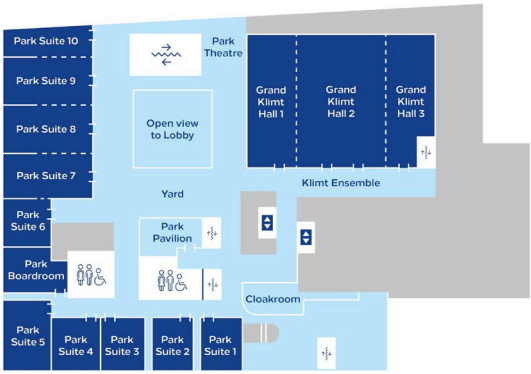
FLOOR MAP KEY

- Meeting/Conference Rooms
- Foyer/Public Space
- Private

Mezzanine M1

FLOOR MAP KEY

- Meeting/Conference Rooms
- Foyer/Public Space
- Private



Keynote Speakers

Kimberly Foster

Tulane University, USA

Biography

Nonlinearity and Sensing: a 30 Year Journey

Monday | October 30, 2023 | 9:00 - 10:00

My work with nonlinearity and microelectromechanical systems began nearly 30 years ago when I began graduate school at Cornell. In this talk, I will look back at the progression of the field over the past 30 years, and use examples from my own work and others, to demonstrate how nonlinearity has played a large role in the sensor revolution. I will touch on not only key inventions and demonstrations, but also discuss how modeling and testing have evolved to enable faster and more effective progress. The increases in sensitivity and bandwidth, along with more sophisticated control algorithms have enabled MEMS to be a key element in smart homes, automobiles and healthcare

Michael L. Roukes

Caltech, USA

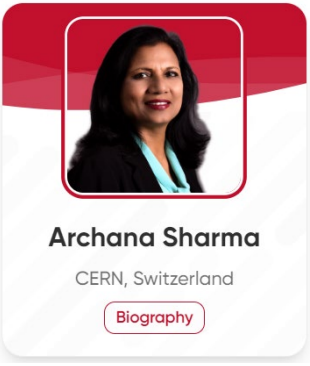
Biography

NEMS and Sensing – From Classical to Quantum

Tuesday | October 31, 2023 | 11:00 - 12:00

It has been over thirty years since my first efforts in 1991 that launched the field of NEMS. Since that time, NEMS has become a truly global endeavor that has engendered amazing milestones from many laboratories. I will survey this landscape, and then turn to some of the exciting possibilities in classical and quantum sensing with NEMS being pursued today.

Keynote Speakers (cont.)



Secrets of the Universe, Technological Advances and Why Should I Care!

Wednesday | November 1, 2023 | 9:00 - 10:00

Imagine a life without the words www or http? They emerged one fine day from a scientific laboratory! The Large Hadron Collider (LHC) at CERN Geneva, Switzerland is home to thousands of high energy physicists. By exploiting large sophisticated radiation sensors, designed and constructed over decades we are cumulatively, seeking answers to questions about the origin, evolution and composition of our universe. At this forefront of scientific pursuit, working hand in hand with industries, spin off technologies have completely changed our lives. With the world wide web, medical imaging, diagnostic and treatment techniques, high-performance computing, space exploration, art restoration to name a few - the audacious, innovative cutting edge technologies of particle physics have entered and transformed mainstream society. In this talk I will trace the adventure of knowledge and technology transfer at CERN and how we can collectively fight pandemics, unknown and some known catastrophes and silent challenges like cancer.

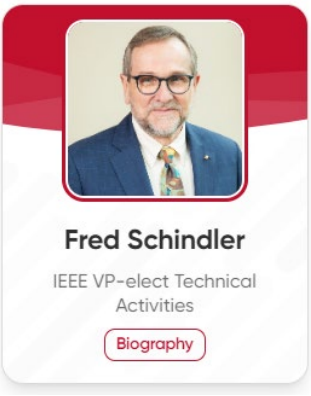
Sensors Council 25th Anniversary Speakers

Technologies for a Sustainable Future!

Tuesday | October 31, 2023 | 15:45 - 17:00

Climate change poses a major threat to the world population across many dimensions, including coastal and inland flooding, wildfires, elevated temperatures, food security and increased storm intensity. Sustainability is of increasing importance as we seek the benefits of circular economy with increasing life cycle energy and environmental efficacy. IEEE is responding by supporting the development of technologies to measure, adapt and mitigate the effects of climate change and address global sustainability using its full range of capabilities, including convening researchers and practitioners at conferences and events, supporting the dissemination of knowledge through world class publications, enabling the development of standards, engaging with policy makers, and engaging in educational activities spanning K12, the general public, media, practitioners and researchers distributed across the planet in the full topical breadth of 47 Societies and Councils, engaging the full capabilities of the IEEE to support the engineering and technology community in this critical effort. Learn how you can join the effort through many different engagement paths.

Sensors Council 25th Anniversary Speakers (cont.)

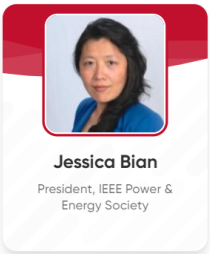


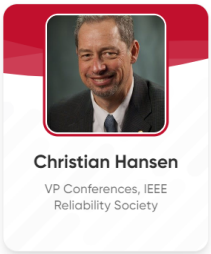
Conference Sustainability Considerations

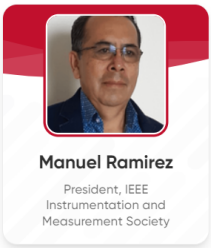
Tuesday | October 31, 2023 | 15:45 - 17:00

Sustainability is a pressing issue in society in general. Sustainability and how it relates to conferences has become a concern. In traditional conferences hundreds or thousands of people travel hundreds or thousands of kilometers to meet. How do we account for the carbon cost of this travel? What are conferences' other carbon costs? Are there, or can there be, offsetting benefits? What have we learned from our virtual experiences during the COVID pandemic, and from the reopening after the pandemic? We will review these questions and what IEEE is doing and can do to address these concerns.

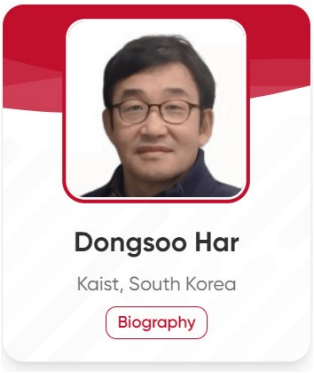
Other Anniversary Speakers







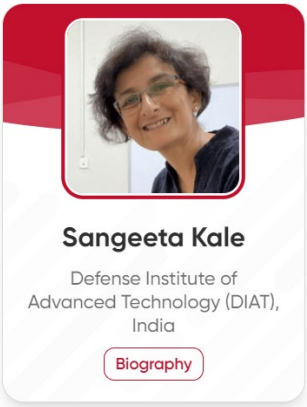
Tutorials



Deep Learning Techniques useful for Designing Sensors and Sensor Networks

Sunday | October 29, 2023 | 8:30 - 10:00

The rapid evolution of deep learning techniques has significantly enhanced the development of high-end Sensors and Sensor Networks. Sensors can now benefit from unparalleled accuracy, adaptability, and fault-tolerance mechanisms. Sensor networks can be empowered with efficient resource allocation, ensuring optimal utilization of resources and minimizing energy consumption. This ability is especially crucial for battery-powered sensors and Internet of Things (IoT) devices, where prolonging battery life is essential for sustainable and cost-effective operations. The integration of advanced algorithms and data processing capabilities empowers sensors and sensor networks to thrive in dynamic environments. The interconnectivity of intelligent sensors enhances data analysis efficiency and fosters collaborative decision-making across industries. This tutorial will present deep learning's profound potential in the context of designing sensors and sensor networks, showcasing how this cutting-edge approach has surpassed conventional limitations and revolutionized problem-solving within the domain of sensors sensor networks.



Metamaterial-inspired Miniaturized Radio-frequency Resonators for Versatile Industrial Sensing Applications

Sunday | October 29, 2023 | 8:30 - 10:00

Sensor Technology juxtaposed with IoT plays a crucial role in modern industrialization era because these sensors collect data from the physical world and convert it into digital signals, which can drive any industrial component (system or process) from a remote location. The sensor market is set to double in upcoming 5 years, as is projected in IoT Analytics in 2023 (https://iot-analytics.com/5-iot-sensor-technologies/). With around 14 billion current IoT connections, more than 50 billion connected sensors have been deployed. In this context, metamaterials, which are artificially engineered and periodically arranged structures, which have been in the scientific research domain for almost a decade now, have attracted immense attention. Using the conventional radio-frequency range and harnessing the properties of the electronic resonator structures offering negative permittivity (and permeability), one can synthesize unit cells of such metamaterial-inspired structures and sensing applications can be envisaged. These are versatile platforms for wide range of industrial applications. **More Info**

Tutorials (cont.)

Radislav A. Potyrailo

GE Global Research, USA

Biography

Next Generation of Gas Sensors: Anticipated and Unanticipated Advantages Over Last-Century Sensor Designs

Sunday | October 29, 2023 | 10:30 - 12:00

It is conventionally expected that the performance of existing gas sensors may degrade in the field compared to laboratory conditions because (i) a sensor may lose its accuracy in the presence of chemical interferences and (ii) variations of ambient conditions over time may induce sensor-response fluctuations (i.e., drift). Breaking this status quo in poor sensor performance requires understanding the origins of design principles of existing sensors and bringing new principles to sensor designs. Existing gas sensors are single-output (e.g., resistance, electrical current, work function, light intensity) sensors, also known as zero-order sensors. Any zero-order sensor is undesirably affected by variable chemical background and sensor drift that cannot be distinguished from the response to an analyte. **More Info**

Michael Shur

Rensselaer Polytechnic Institute, USA

Biography

Sensing Using Terahertz Radiation

Sunday | October 29, 2023 | 10:30 - 12:00

Terahertz (THz) sensing is enabling technology for 6G communication, detection of biological and chemical hazardous agents, cancer detection, monitoring of industrial processes and products, and detection of mines and explosives. THz sensors support security in buildings, airports, and other public spaces. They found important applications in radioastronomy and space research and, more recently, in Artificial Intelligence-driven THz sensing of MMICs and VLSI. Exploding demand for data transfers will require using the 300 GHz band after 2028 or even before and will make the deployment of THz sensing electronics inevitable. This lecture will discuss the new physics of THz sensing and THz sensing devices. It will also review software for THz sensing and THz sensor design, the THz sensing market, and key THz sensor companies. **More Info**

Tutorials (cont.)

COPLANAR CAPACITIVE SENSORS: DESIGN, OPTIMIZATION, AND APPLICATIONS

Sunday | October 29, 2023 | 10:30 - 12:00

Coplanar capacitive sensors contain a transducer consisting of two or more coplanar electrodes. The sensing paradigm offers many advantages but is especially favorable for fabrication through printing techniques due to the single-layer structure. For transduction, the technique relies on a fringing electric field, which occurs when a differential voltage is applied to the two electrodes. This fringing electric field interacts with overlaid materials, and the measured capacitance is influenced directly by the relative permittivity of the material set. This influence can be utilized to sense various parameters that induce the relative permittivity change such as pressure, humidity, biological interaction, and others. In this tutorial, I will present a theoretical framework for understanding the transduction in a variety of scenarios. This framework, which can be utilized for sensor optimization, is validated through finite element modeling techniques. Coplanar capacitive sensors have been used in many demonstrations, including moisture sensing, pressure sensing, and biological sensing. Each of these applications will be used as a case-study into the advantages and disadvantages of the technique. Ultimately, this tutorial will provide burgeoning and experienced researchers an opportunity to learn more about the sensing paradigm and how it can potentially be used within their research. **More Info**

Biospectroscopy-based Biosensing Platforms

Sunday | October 29, 2023 | 13:30 - 15:00

The latest innovations in biosensors and emerging applications have been used to deliver easy-to-use diagnostic systems for healthcare. Today's leading biotechnology companies are developing novel semi-synthetic ligands, aptamers, peptides, and conducting polymers to produce functional systems that can deliver precise molecular information for early diagnosis of diseases. Biosensors are powerful tools for environmental, human and animal health monitoring, especially when they are used with bioimpedance spectroscopy. The main topic of this tutorial is about Bioimpedance Analysis (BIA) using biosensors as miniaturized and disposable detection devices for specific chemical (or set of chemicals), biomolecules, adulterants and microorganism analysis in different fields concerning health point-of-care, food quality, food safety and pollution. For that, this tutorial aims to gather original articles and reviews showing research advances, fabrication, innovative applications, new challenges and future perspectives of BIA-based (Bio)sensors in important areas as biomedical engineering, health, IoT, agri-food and environmental. **More Info**

Tutorials (cont.)

Marco Del Sarto

STMicroelectronics, France

Biography

Heterogeneous Integration: Sensors Point of View

Sunday | October 29, 2023 | 13:30 - 15:00

IEEE Heterogenous Integration Roadmap started to define clearly the nomenclature and meaning related to what we can call “more than Moore” development for microelectronics circuits.

Our workshop will give its participants a comparison of advanced packaging solution with the ones used on MEMS and sensor environment highlighting similarities and difference with the scope to define common understanding and language also on the sensor package arena. **More Info**

Tushar Kanti Bera

NIT Durgapur, India

Biography

Sensors and Sensing Technologies for Battery Electric Vehicles (BEVs) and Hybrid Electric Vehicles (HEVs)

Sunday | October 29, 2023 | 15:30 - 17:00

Electrical Vehicle (EV) is introduced to reduce the consumption of the fossil-fuel and to reduce the environmental pollution in transportation. The EVs are driven by electric motors which are fed by electrical power stored in the rechargeable-batteries connected in series and parallel to form a battery-bank. In EV and plugged-in hybrid EVs (PHEVs), the EV battery banks play a significant role and hence are designed carefully to ensure the desired vehicle-performance, safety, weight and the driving-range. To obtain the controlled operation of the EVs, a number of sensors are used on its various parts including the battery bans. The temperature, state of charge, voltage, current, temperature, cell balancing conditions are monitored by the installed-sensors and controlled by the battery management systems (BMS). Sensors are also used to monitor the motor RPM, torque, power along with other standard sensors. The proposed tutorial, designed for the students, scholars and young faculties will discuss the sensors and sensing technologies used for modern battery electric vehicles (BEVs) and hybrid electric vehicles (HEV). The applications, advantages and recent trends of different sensors will be discussed followed by the limitation and challenges. The battery pack modelling and simulation will be discussed in the hands-on session. **More Info**

Tutorials (cont.)

Andreas Schütze

Universitat des Saarlandes, Germany

Biography

Setting Standards for Indoor Air Quality Sensors Based on VOCs

Sunday | October 29, 2023 | 15:30 - 17:00

Environmental pollution is still one of the greatest challenges for Europe and worldwide. While outdoor air quality is frequently discussed in terms of NOx or ozone levels, indoor pollution is often overlooked. However, as many people spend most of their time indoors and because of increased building insulation and reduced air exchange, indoor pollution levels can be significantly higher and actually contribute similarly to the overall burden of disease.
More Info

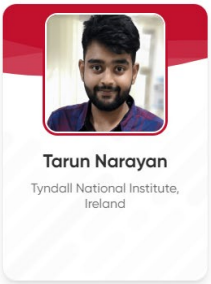
Workshops

Sustainable Agri Food and Environment (SAFE) Sensors

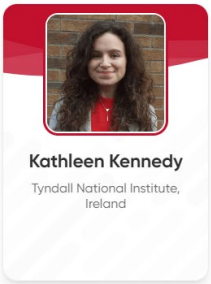
Sunday | October 29, 2023 | 8:30 - 12:00

The workshop provide an overview of advancement with microelectrodes array technology. The development and application of these sensors have become increasingly important in various fields, including biomedical, environmental, and industrial applications. We will cover the basic principles of microelectrode sensor design and fabrication and explore various simulation tools available for designing and optimizing sensor performance. It will display how these electrodes can be simulated using COMSOL highlighting different application. We will show the importance of sustainability in sensor development and discuss strategies for reducing the environmental impact of sensor manufacturing and disposal. The workshop will also focus on techniques like surface acoustic wave and electrochemical-based sensors. In hands on/ demo session we will also demonstrate microelectrodes sensor with application like milk stability testing, gas sensing and soil nutrient detection. **More Info**

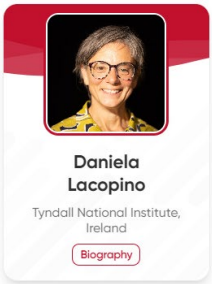
Alan O'Riordan
Tyndall National Institute, Ireland



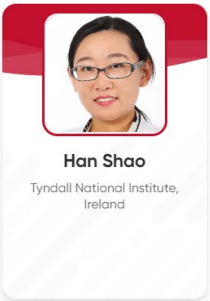
Tarun Narayan
Tyndall National Institute, Ireland



Kathleen Kennedy
Tyndall National Institute, Ireland

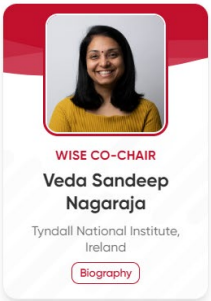


Daniela Lacopino
Tyndall National Institute, Ireland
Biography



Han Shao
Tyndall National Institute, Ireland

Shane O'Sullivan
Tyndall National Institute, Ireland



WISE CO-CHAIR
Veda Sandeep Nagaraja
Tyndall National Institute, Ireland
Biography

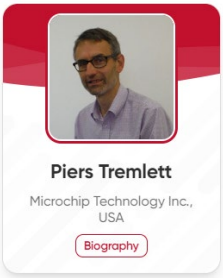
Workshops (cont.)

ZeroAMP – Logic, Memory, Sensors and More for Harsh Environments

Sunday | October 29, 2023 | 8:30 - 17:00

The European H2020 ZeroAMP project (https://www.zeroamp.eu) is developing foundations for future use of nanoelectromechanical (NEM) switches in integrated circuits (ICs). As NEM switches can tolerate operating temperatures of up to 300°C and radiation levels of 5 Mrad, they are ideally suited to bring electronics into harsh environments which are not accessible for conventional CMOS-based ICs.

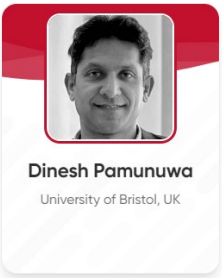
Our workshop will give its participants a general overview of the NEM technology platform developed in ZeroAMP. Initial applications and their potential for future sensor and status monitoring devices will be discussed and a path towards commercial exploitation of the technology in ZeroAMP´s follow-up Horizon Europe project i-EDGE (https://www.i-edge-project.eu) will the outlined. The workshop will feature an interactive panel session to allow participant to familiarize themselves with basic NEM switch and integration concepts, the current state of the art and potential application scenarios for NEM switch-based ICs.



Piers Tremlett

Microchip Technology Inc., USA

Biography



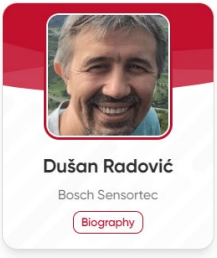
Dinesh Pamunuwa

University of Bristol, UK

Consumer Inertial MEMS – High Tech in Your Hands

Sunday | October 29, 2023 | 13:30 - 17:00

Micro Electro-Mechanical Systems (MEMS) devices are used in many applications nowadays. This workshop aims to reveal more details on one group of MEMS sensors, namely MEMS based Inertial Measurement Units (IMUs). Those are being widely used in consumer electronic products for a large variety of applications. We also give each participant opportunity to learn more by “playing” with inertial sensors in their smart phones / tablets (they bring with) or using demo sensor board which will be available during the workshop. **More Info**



Dušan Radović

Bosch Sensortec

Biography

Rainer Schillinger

Bosch Sensortec

Workshops (cont.)

Bioimpedance-based Sensing Platforms

Sunday | October 29, 2023 | 8:30 - 17:00

This workshop aims to gather original articles on advances, fabrication, innovative applications, new challenges and future perspectives of BIA-based (Bio)sensors in important areas of biomedical engineering, health, IoT, agri-food and environmental. There will be 3 oral presentations in the morning with a break between. The other 2 oral presentations will after lunch break, followed by a practical presentation by ScioSpec showing how to perform a biological impedance analysis using the company's spectrometer. At the end, a panel discussion will be formed to discuss feature trends on bioimpedance sensing platforms for industrial applications.

Yekta Ülgen
Acibadem University, Turkey
Biography

Martin Bulst
Sciospec Scientific Instruments GmbH, Germany

Tushar Kanti Bera
NIT Durgapur, India
Biography

Jie Hou
University of Oslo, Norway

Fred-Johan Pettersen
Oslo University Hospital and University of Oslo, Norway
Biography

Ørjan G. Martinsen
University of Oslo, Norway

Special Session on Research Funding

Usha Varshney

National Science Foundation (NSF), USA

Biography

Mode of International Collaboration at the US National Science Foundation

Sunday | October 29, 2023 | 17:00 - 18:00

The U.S. National Science Foundation (NSF) is an independent federal agency that supports science and engineering in all U.S. states and territories. NSF was established by Congress in 1950 to promote the progress of science; advance the national health, prosperity, and welfare; and secure the national defense. NSF investments account for about 25% of federal support to America's colleges and universities for basic research.

The NSF's directorates and offices invest in researchers to support basic research across all fields of fundamental science and engineering for discovery and innovation; development of research infrastructure and state- of-the-art tools to sustain the nation's scientific enterprise; and education and training programs for individuals from diverse backgrounds. In addition, NSF supports research partnerships between colleges and universities, industry, nonprofits, government, and other organizations within the U.S. and across the globe. NSF fulfills its mission primarily using a grant mechanism based on a peer review process. NSF supports researchers at all levels ranging from senior researchers, early-career researchers, postdoctoral researchers, graduate and undergraduate students, preK-12, as well as entrepreneurs.

This presentation will provide an overview of NSF Directorates and Divisions that are aligned with the theme of this conference. The mode of collaboration for international researchers to partner with U.S. researchers through various programs and initiatives at NSF will be presented.

Luiz Santos

European Research Council Execute Agency

Biography

European Research Council – Funding Opportunities for Creative Minds From All Over the World

Sunday | October 29, 2023 | 17:00 - 18:00

The European Research Council (ERC) is an institution of the European Union, whose mission is to encourage the highest quality research in Europe through competitive funding and to support investigator-initiated frontier research across all fields, based on scientific excellence.

It funds creative researchers of any nationality to run projects based across Europe.

At the IEEE SENSORS 2023, we would like to present to this prestigious community the ERC funding schemes and its Work Programme 2024.

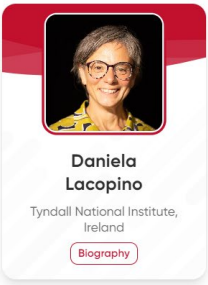
WiSe Session

Women in Sensors (WiSe) aims to promote globally, the presence and advancement of persons who identify as women in the technical area and professions related to sensors. It is targeted at professional women in sensing technology, from industry or academia, and will provide the opportunity to create communities to facilitate knowledge sharing and provide support through highly interactive sessions designed to foster discussion and collaboration. Visit us at https://ieee-sensors.org/women-in-sensors-wise/

Celebrating the Success Stories of Women Achievers in Sensor Domains

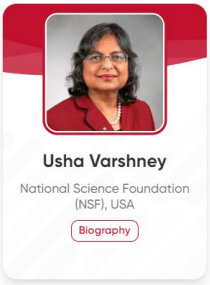
Monday | October 30, 2023 | 13:30 - 15:30

Panelists | 13:30 - 14:45



Daniela Lacopino
Tyndall National Institute, Ireland
Biography

Enakshi Bhattacharya
IIT Madras, India
Biography

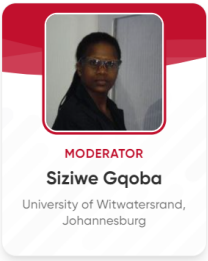


Usha Varshney
National Science Foundation (NSF), USA
Biography

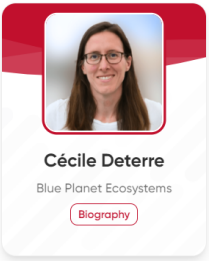
Erika Györvary
CSEM, Switzerland
Biography

Kimberly Foster
Tulane University, USA
Biography

Panelists (Start ups)
14:45 - 15:30

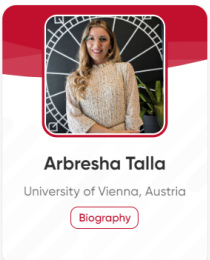


MODERATOR
Siziwe Gqoba
University of Witwatersrand, Johannesburg

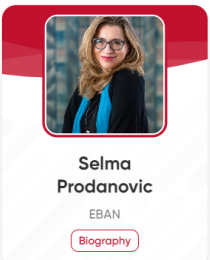


Cécile Deterre
Blue Planet Ecosystems
Biography

Grazyna Palecka
One:Solutions Engineering GmbH
Biography



Arbresha Talla
University of Vienna, Austria
Biography



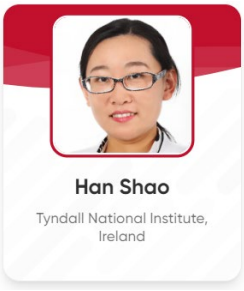
Selma Prodanovic
EBAN
Biography

WiSe & YP Big Idea Pitch Competition

Wednesday | November 1, 2023 | 13:30 - 15:30

This competition is to motivate young students/researchers to develop entrepreneurial and business mindsets with their skills and training on sensor research and development

Judges



YP Panel Discussion

Poster Session

Sunday | October 29, 2023 | 19:00 - 21:00

This poster session is dedicated to young professionals (YP) to showcase their research work to the sensor community. The presenter of this poster must be a YP.

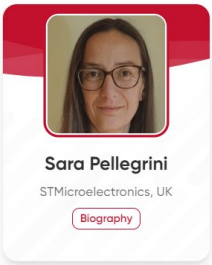
IEEE Young Professionals (YP) is a group of IEEE members and volunteers who have graduated from their first professional degree within the past 15 years.

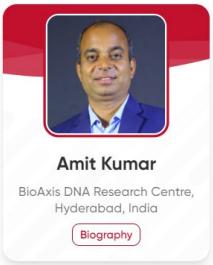
One can present their consolidated thesis work, start-up activities, and any research articles of their own on a poster. Start-ups also can present their research/product development. The content must contain technical and research works only. The poster will be evaluated and awards will be given to the best poster and runner-up.

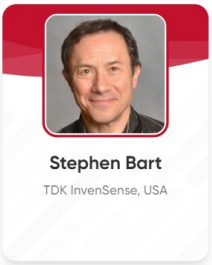
Career Opportunities for Young Professionals in Sensors and Related Industries

Monday | October 30, 2023 | 15:30 - 16:30

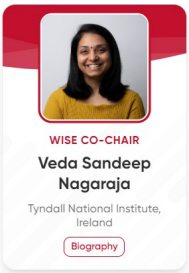
Panelists







Moderator



Industry

Industry Session

Monday | October 30, 2023 | 13:30 - 15:30

Gilles Lunzenfichter
Medisante-Group
Biography

Andreas Drauschke
Technikum Wien, Austria
Biography

Brian Lohse
Force Technology
Biography

Uwe Artmann
Image Engineering GmbH
Biography

Featuring the following presentations:

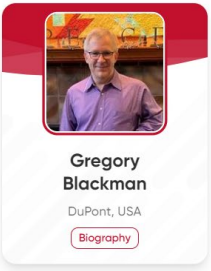
- Cellular IoT: Why Healthcare is Lagging Other Industries in IoT Adoption?
- Centre for Advanced Sensor Technology (CAST) -Challenges in current and future Corrosion Sensors
- IEEE-P2020 - Automotive Image Quality - Overview of all KPIs described by the standard
- Potentials of Interferometic Sensors in Medical Engineering

Industry Workshop: Electronic Skin Patches: Convergent Technologies for Vital Signs Monitoring

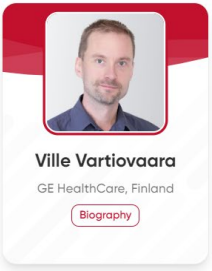
Tuesday | October 31, 2023 | 8:30 - 15:30

Vital Signs Monitoring (VSM) is the process of measuring and tracking important physiological parameters to assess the overall health and well-being of an individual. Monitoring human body activity is now opening the way to new opportunities for both wellness/fitness and medical applications, ranging from heart analysis, respiration rate and SpO2 to blood pressure and body temperature. Nowadays, common practice is to have just punctual snapshots of vital signs by electrocardiograms, glycemia level, spO2 and blood pressure through medical examination. New technologies are enablers for a continuous measurement of these health parameters to infer and predict organs/ tissues, and metabolic pathways malfunctions. For instance, continuous glucose monitoring (CGM) best illustrates this revolution with significant improvement in diabetic patients well-being. **More Info**

INDUSTRY CO-CHAIR
Enrico Alessi
STMicroelectronics, Italy
Biography



Gregory Blackman
DuPont, USA
Biography



Ville Vartiovaara
GE HealthCare, Finland
Biography

Leonardo Baldasarre
TDK InvenSense, Milan
Biography

IEEE Sensors Council 25th Anniversary

Sensors Council is celebrating its 25th Anniversary this year! To commemorate this milestone, the Council will have a variety of events and activities throughout the year culminating with the celabtatory Ball at IEEE SENSORS 2023.

IEEE Sensors Council 25th Anniversary Speaker Session

Tuesday | October 31, 2023 | 15:45 – 17:00
Location: Grand Park Hall

15:45 | IEEE President's Message
15:50 | IEEE Sensors Council Milestones
15:53 | Sustainability in IEEE Sensors Council
16:03 | Technologies for a Sustainable Future
16:28 | Conference Sustainability Considerations
16:38 | IEEE Member Society Presidents

IEEE Sensors Council Award Ceremony

Tuesday | October 31, 2023 | 17:00 – 17:30
Location: Grand Park Hall

IEEE Sensors Council 25th Anniversary Ball

Tuesday | October 31, 2023 | 19:00 – 23:30
Location: The Hofburg, 1010 Vienna, Austria

YP WELCOME RECEPTION & POSTER SESSION

This poster session is dedicated to young professionals (YP) to showcase their research work to the sensor community. The presenter of this poster must be a YP.

Sunday | October 29, 2023 | 19:00 – 21:00
Location: Vienna City Hall, Entrance Lichtenfelsgasse 2, 1010 Vienna

SUNDAY, OCTOBER, 29, 2023

IEEE SENSORS 2023

	Park Suite 1	Park Suite 2	Park Suite 3	Park Suite 4	Park Suite 5	Park Suite 7
7:00						
7:30	Registration Room: Grand Park Lobby					
8:00						
8:30	T: Metamaterial-inspired Miniaturized Radio-frequency Resonators for Versatile Industrial Sensing Applications	T: Deep Learning Techniques useful for Designing Sensors and Sensor Networks		WS: Bioimpedance-based Sensing Platforms	WS: Sustainable Agri Food and Environment (SAFE) Sensors	WS: ZeroAMP – Logic, Memory, Sensors and More for Harsh Environments
9:00						
9:30						
10:00	Coffee Break | Room: The Yard					
10:30	T: Sensing Using Terahertz Radiation	T: Next Generation of Gas Sensors: Anticipated and Unanticipated Advantages Over Last-Century Sensor Designs	T: Coplanar Capacitive Sensors: Design, Optimization, and Applications	WS: Bioimpedance-based Sensing Platforms	WS: Sustainable Agri Food and Environment (SAFE) Sensors	WS: ZeroAMP – Logic, Memory, Sensors and More for Harsh Environments
11:00						
11:30						
12:00	Lunch Room: Restaurant LENZ & Selleny´s Bar					
12:30						
13:00						
13:30	T: Biospectroscopy-based Biosensing Platforms	T: Heterogeneous Integration: Sensors Point of View		WS: Bioimpedance-based Sensing Platforms	WS: Consumer Inertial MEMS – High Tech in Your Hands	WS: ZeroAMP – Logic, Memory, Sensors and More for Harsh Environments
14:00						
14:30						

SUNDAY, OCTOBER, 29, 2023

IEEE SENSORS 2023

	Park Suite 1	Park Suite 2	Park Suite 3	Park Suite 4	Park Suite 5	Park Suite 7
15:00	Coffee Break | Room: The Yard					
15:30	T: Sensors and Sensing Technologies for Battery Electric Vehicles (BEVs) and Hybrid Electric Vehicles (HEVs)	T: Setting Standards for Indoor Air Quality Sensors Based on VOCs		WS: Bioimpedance-based Sensing Platforms	WS: Consumer Inertial MEMS – High Tech in Your Hands	WS: ZeroAMP – Logic, Memory, Sensors and More for Harsh Environments
16:00						
16:30						
17:00	Special Session on Research Funding Room: Grand Park Hall					
17:30						
18:00						
18:30						
19:00	YP Welcome Reception/ Poster Session Room: Vienna City Hall					
19:30						
20:00						
20:30						

MONDAY, OCTOBER 30, 2023

IEEE SENSORS 2023

	Park Suite 1	Park Suite 2	Park Suite 3	Park Suite 4	Park Suite 5	Park Suite 6	Park Suite 7	Park Suite 8	Park Suite 9	Green Room 1
7:30	Registration Room: Grand Park Lobby									
8:00										
8:30	Opening Ceremony | Room: Grand Park Hall									
9:00	KN: Kimberly Foster Room: Grand Park Hall									
9:30										
10:00	Coffee Break | Room: Grand Klimt Hall									
10:30	Materials and Testing	Integrated and MEMS Sensing Technologies	Sensor Materials, Fabrication and Packaging I	Wearable Sensors and Systems I	Emerging Sensors for Biomedical Applications	Sensor Technologies for Sustainable Development	Sensor Systems in Health Care	Chemical, Electrochemical and Gas Sensors I	Biomedical and Other Physical Sensors	Meet the Editors Panel
11:00										
11:30										
12:00	Lunch Room: Restaurant LENZ & Selleny´s Bar									
12:30										
13:00										
13:30	Poster Session 1 | Coffee Break Room: Grand Klimt Hall								WiSe Speaker Session	Industry Session
14:00										
14:30										
15:00										

MONDAY, OCTOBER 30, 2023

IEEE SENSORS 2023

	Park Suite 1	Park Suite 2	Park Suite 3	Park Suite 4	Park Suite 5	Park Suite 6	Park Suite 7	Park Suite 8	Park Suite 9	Green Room 1
15:30	YP Panel Discussion	Advanced Modeling, Algorithm, and Machine Learning Techniques	Advanced Sensing Systems	Biosensors	Emerging Sensors for Remote, Environmental, and Deformation Sensing	Sensor Networks and IOT	Optical Sensors I	Sensor Data Processing & AI: Human Activity and Biomedical Applications	Force and Pressure Sensors	
16:00										
16:30										
17:00										

TUEDAY, OCTOBER 31, 2023

IEEE SENSORS 2023

	Park Suite 1	Park Suite 2	Park Suite 3	Park Suite 4	Park Suite 5	Park Suite 6	Park Suite 7	Park Suite 8	Park Suite 9
7:30 8:00	Registration Room: Grand Park Lobby								
8:30 9:00	Condition Monitoring	Systems: Machine Learning and Motion Control	Advanced Localization and Tracking Techniques	Wearable, Flexible and Textile Sensing	Sensor Materials, Fabrication and Packaging II	Optical Sensors: Materials and Applications	Chemical, Electrochemical and Gas Sensors III	Sensor Phenomenology, Modeling and Evaluation I	WS: Electronic Skin Patches: Convergent Technologies for Vital Signs Monitoring
9:30 10:00	Pressure and Magnetic Sensors	Networks and IoT	Imaging	Advanced Image Sensing Techniques	Terahertz and Optical Sensors	MEMS Technology and Applications	Chemical, Electrochemical and Gas Sensors IV	Sensor Phenomenology, Modeling and Evaluation II	
10:30	Coffee Break | Room: Grand Klimt Hall								
11:00 11:30	KN: Michael L. Roukes Room: Grand Park Hall								
12:00 12:30 13:00	Lunch Room: Restaurant LENZ & Selleny´s Bar					WiSe Mentor/ Mentee Lunch Room: Restaurant LENZ & Selleny´s Bar			
13:30 14:00 14:30 15:00	Biosensors: Materials and Applications	Advanced Chemical and Bio-Sensors	Advanced Fiber-optic Sensors	Wearable Sensors and Systems II	Microfluidics and Biomedical Applications	Acoustic and Ultrasonic Sensors	Sensor Systems and Processing	Sensor Data Processing & AI: Industrial and Environmental Applications	WS: Electronic Skin Patches: Convergent Technologies for Vital Signs Monitoring

TUEDAY, OCTOBER 31, 2023

IEEE SENSORS 2023

	Park Suite 1	Park Suite 2	Park Suite 3	Park Suite 4	Park Suite 5	Park Suite 6	Park Suite 7	Park Suite 8	Park Suite 9
15:30	Coffee Break | Room: Grand Klimt Hall								
16:00	Sensors Council 25th Anniversary Talk: Technologies for a Sustainable Future Room: Grand Park Hall								
16:30									
17:00	Council Awards | Room: Grand Park Hall								
17:30									
18:00									
18:30									
19:00	Gala Dinner Room: The Hofburg								
19:30									
20:00									
20:30									
21:00									
21:30									
22:00									
22:30									
23:00									

WEDNESDAY, NOVEMBER 1, 2023

IEEE SENSORS 2023

	Park Suite 1	Park Suite 2	Park Suite 3	Park Suite 4	Park Suite 5	Park Suite 6	Park Suite 7	Park Suite 8	Park Suite 9
8:00	Registration Room: Grand Park Lobby								
8:30									
9:00	KN: Archana Sharma Room: Grand Park Hall								
9:30									
10:00	Coffee Break | Room: Grand Klimt Hal								
10:30	Healthcare: Diagnostics and Monitoring	Chemical Sensors	Bio-Remote Sensing and Integrated Artificial Intelligence Systems	Chemical Agent Detection: Sensing Technologies and Sensing Applications	Session: Actuators, Energy Harvesters and Powering Sensors	Smart Biomedical Sensor Platforms in Resource Constrained Settings	Optical Sensors II	Sensor Data Processing & AI: Localization and Navigation Sensors	Chemical, Electrochemical and Gas Sensors II
11:00									
11:30									
12:00	Lunch Room: Restaurant LENZ & Selleny´s Bar								
12:30									
13:00									
13:30	Poster Session 2 Room: Grand Klimt Hall								WiSe/ YP BIP
14:00									
14:30									
15:00	Healthcare: AI and Assistive Technologies	Environmental Monitoring	LiDAR, Radar, and RF Sensors	Novel Interfacing Techniques for Sensing Systems	Recent Advancement in Sensing Techniques	Sensors in Industrial Practices	Optical Sensors III	Sensor Data Processing & AI: Automotive Perception	Magnetometers and Navigation Sensors
15:30									
16:00									

WEDNESDAY, NOVEMBER 1, 2023

IEEE SENSORS 2023

	Park Suite 1	Park Suite 2	Park Suite 3	Park Suite 4	Park Suite 5	Park Suite 6	Park Suite 7	Park Suite 8	Park Suite 9
16:30	Conference Award Ceremony (supported by the IEEE MEMS Technical Community) / 2024 Conference Announcement Room: Grand Park Hall								
17:00									
17:30	Closing Remarks | Room: Grand Park Hall								

Technical Program: Sunday, October 29

7:30 - 8:30
Registration
Room: Grand Park Lobby

8:30 - 10:00
Tutorial: Metamaterial-inspired Miniaturized Radio-frequency Resonators for Versatile Industrial Sensing Applications
Room: Park Suite 1

8:30 - 10:00
Tutorial: Deep Learning Techniques useful for Designing Sensors and Sensor Networks
Room: Park Suite 2

8:30 - 17:00
Workshop: Bioimpedance-based Sensing Platforms
Room: Park Suite 4

8:30 - 12:00
Workshop: Sustainable Agri Food and Environment (SAFE) Sensors
Room: Park Suite 5

8:30 - 17:00
Workshop: ZeroAMP – Logic, Memory, Sensors and More for Harsh Environments
Room: Park Suite 7

10:00 - 10:30
Coffee Break
Room: The Yard

10:30 - 12:00
Tutorial: Sensing Using Terahertz Radiation
Room: Park Suite 1

10:30 - 12:00
Tutorial: Next Generation of Gas Sensors: Anticipated and Unanticipated Advantages Over Last-Century Sensor Designs
Room: Park Suite 2

10:30 - 12:00
Tutorial: Coplanar Capacitive Sensors: Design, Optimization, and Applications
Room: Park Suite 3

12:00 - 13:30
Lunch
Room: Restaurant LENZ & Selleny´s Bar

Technical Program: Sunday, October 29

13:30 - 15:00
Tutorial: Biospectroscopy-based Biosensing Platforms
Room: Park Suite 1

13:30 - 15:00
Tutorial: Heterogeneous Integration: Sensors Point of View
Room: Park Suite 2

13:30 - 17:00
Workshop: Consumer Inertial MEMS – High Tech in Your Hands
Room: Park Suite 5

15:00 - 15:30
Coffee Break
Room: The Yard

15:30 - 17:00
Tutorial: Sensors and Sensing Technologies for Battery Electric Vehicles (BEVs) and Hybrid Electric Vehicles (HEVs)
Room: Park Suite 1

15:30 - 17:00
Tutorial: Setting Standards for Indoor Air Quality Sensors Based on VOCs
Room: Park Suite 2

17:00 - 18:00
Special Session on Research Funding
Room: Grand Park Hall

19:00 - 21:00
YP Welcome Reception & Poster Session
Room: Vienna City Hall

7:30 - 8:30
Registration
Room: Grand Park Lobby

8:30 - 9:00
Opening Ceremony
Room: Grand Park Hall

9:00 - 10:00
Keynote: Nonlinearity and Sensing: a 30 Year Journey
Kimberly Foster, *Tulane University, USA*
Room: Grand Park Hall
Session Chair(s): Thilo Sauter, *TU Wien and Danube University Krems*
Ravinder Dahiya, *Northeastern University, Boston*

10:00 - 10:30
Coffee Break/Exhibit Hall
Room: Grand Klimt Hall

10:30 - 12:00
Meet the Editors Panel
Room: Green Room 1
Moderator: Krikor Ozanyan, *The University of Manchester, UK*

10:30 - 12:00
A1L-01: Materials and Testing
Room: Park Suite 1
Session Chair(s): Sandro Carrara, *École Polytechnique Fédérale de Lausanne*
Mitradip Bhattacharjee, *Indian Institute of Science Education and Research, Bhopal*

10:30
Sensors Letters Paper
2065: Mono-Layer Graphene Transfer on a Multi-Layered Flexible Substrate for Bio-Sensor Fabrication
Kamalesh Tripathy, Mitradip Bhattacharjee
Indian Institute of Science Education and Research, Bhopal, India

10:45
Sensors Letters Paper
2104: Organic and Metallic Sensors on Complex 3-D Object Using an Original Method: Water Transfer Printing
Rafika Selmi, Jean Charles Fustec, Maxime Harnois, France Le Bihan
Université de Rennes, France

11:00

Sensors Letters Paper

1932: Losses-Assisted Sensitivity Enhancement in Reflective Mode-Phase-Variation Permittivity Sensors Based on Weakly Coupled Distributed Resonators

Pau Casacuberta, Paris Vélez, Jonathan Muñoz-Enano, Lijuan Su, Ferran Martín
Universitat Autònoma de Barcelona, Spain

11:15

Sensors Letters Paper

2099: Characterization of Curved Piezoelectric Micromachined Ultrasound Transducers (pMUTs) Fabricated by Chip-Scale Glass Blowing Technique

Chichen Huang{1}, Shubham Khandare{2}, Sri-Rajasekhar Kothapalli{2}, Srinivas Tadigadapa{1}
{1}Northeastern University, United States; {2}Pennsylvania State University, United States

11:30

Sensors Letters Paper

2100: GHz Fingerprint Acoustic Imaging by Mechanically Scanning a Soft Conductive Probe on Epitaxial PbTiO3 Films

Yuna Koike, Yusuke Sato, Takahiko Yanagitani
Waseda University, Japan

11:45

Sensors Letters Paper

2120: Non-Destructive Measurement of Micro Coating Thickness Using Sweep Frequency Photoacoustic Sensing Technique

Abhijeet Gorey, Chirabrata Bhaumik, Tapas Chakravarty, Annesha Mazumder, Arijit Sinharay, Subhadeep Basu, Rajat Das, Arpan Pal
TATA Consultancy Services Limited , India

10:30 - 12:00
A1L-02: Integrated and MEMS Sensing Technologies
Room: Park Suite 2
Session Chair(s): J.-C. Chiao, *SMU*
Mark Cheng, *The University of Alabama*

10:30

Invited Journal Author

10.1109/JSEN.2023.3250401: High Resolution Dielectric Characterization of Single Cells and Microparticles Using Integrated Microfluidic Microwave Sensors

Arda Secme, Uzay Tefek, Burak Sari, Hadi Sedaghat Pisheh, Hatice Dilara Uslu, Ozge Akbulut, Berk Kucukoglu, Ramazan Tufan Erdogan, Hashim Alhmoud, Ozgur Sahin, Mehmet Selim Hanay
Bilkent University, Turkey

10:45

Invited Journal Author

10.1109/JSEN.2023.3243783: Bayesian Sensor Calibration of a CMOS-Integrated Hall Sensor Against Thermomechanical Cross-Sensitivities

Moritz Berger{1}, Christian Schott{2}, Oliver Paul{1}
{1}Albert-Ludwigs-Universität Freiburg, Germany; {2}Melexis Technologies SA, Switzerland

11:00

Invited Journal Author

10.1109/JSEN.2023.3244663: A VCO-Based ADC with Direct Connection to a Microphone MEMS, 80-dB Peak SNDR and 438?W Power Consumption

Carlos Perez{1}, Ruben Garvi{1}, Guillermo Lopez{1}, Andres Quintero{2}, Francois Leger{3}, Pedro Amaral{3}, Andreas Wiesbauer{3}, Luis Hernandez{1}
{1}Carlos III University, Spain; {2}Infineon Technologies AG, Austria; {3}Infineon Technologies Austria AG, Austria

11:15

Invited Journal Author

10.1109/JSEN.2023.3262682: A 17.6-Bit 800-SPS Energy-Efficient Read-Out IC with Input Impedance Boosting

Jooyeol Rhee{1}, Wooyoung Kim{2}, Suhwan Kim{2}
{1}Gachon University, Korea; {2}Seoul National University, Korea

11:30

Invited Journal Author

10.1109/JSEN.2023.3255415: Thermal Stress Resistance for the Structure of MEMS-Based Silicon Differential Resonant Accelerometer

Jing Zhang{1}, Tianhao Wu{1}, Yudong Liu{1}, Chen Lin{2}, Yan Su{1}
{1}Nanjing University of Science and Technology, China; {2}Tsinghua University, China

11:45

Sensors Letters Paper

2093: Initial Demonstration of Fused Silica Dual-Shell Gyroscope Using Indirect Method of Piezoelectric Excitation

Danmeng Wang{2}, Nicholas Strnad{1}, Andrei Shkel{2}
{1}DEVCOM Army Research Laboratory, United States; {2}MicroSystems Laboratory, University of California, Irvine, United States

10:30 - 12:00
A1L-03: Sensor Materials, Fabrication and Packaging - 1
Room: Park Suite 3
Session Chair(s): Arum Han, *Texas A&M University*
Ulrich Schmid , *TU Wien*

10:30

INVITED

1922: Microstructures on Demand: 3D Printing Across Length-Scales and Materials - A Key Enabler for Device and System Engineering

Frederik Kotz-Helmer{2}, Dorothea Helmer{2}, Bastian Rapp{1}
{1}Freiburg Material Research Center, University of Freiburg, Germany; {2}Glassomer GmbH, University of Freiburg, Germany

11:00
1305: Piezoelectret Sensors from Direct 3D-Printing Onto Bulk Films
Youssef Sellami, Omar Ben Dali, Romol Chadda, Sergey Zhukov, Mahdi Guermazi, Alexander Anton Altmann, Heinz von Seggern, Bastian Latsch, Niklas Schäfer, Mario Kupnik
Technische Universität Darmstadt, Germany

11:15
1473: Simple Fabrication Process for High-Sensitive Flexible Capacitive Force Sensor Using PDMS
Pranav Deshpande, Prasanna Kumar Routray, Soumya Dutta, Manivannan M
Indian Institute of Technology Madras, India

11:30
1900: Ultrasound Transducer Made of Nanoporous PVDF for Underwater Communications
Fairoz Abida{1}, Rong Fu{1}, Aijun Song{1}, Pai-Yen Chen{2}, Mark Ming-Cheng Cheng{1}
{1}University of Alabama, United States; {2}University of Illinois Chicago, United States

11:45
1818: Chronic Dielectric Performance of Parylene-Modified Polydimethylsiloxane for Insulating Stretchable Electronics
Kaushal Sumaria, Hongyao Geng, Tingyi Liu
University of Massachusetts Amherst, United States

10:30 - 12:00
A1L-04: Wearable Sensors and Systems - 1
Room: Park Suite 4
Session Chair(s): Sahika Inal, *King Abdullah University of Science and Technology (KAUST)*
Jürgen Kosel, *Silicon Austria Labs (SAL)*

10:30
INVITED
2074: Why patient-to-Patient Variations Limit Diagnostically Relevant Biosensors
Janos Vörös
Institute for Biomedical Engineering, Laboratory of Biosensors and Bioelectronics, ETH Zürich, Switzerland

11:00
1452: ModAu: Modernized Auscultation
Dennis Laurijssen{1}, Toon Stas{2}, Rens Baeyens{2}, Kris Ides{2}, Peter Delputte{2}, Stijn Verhulst{2}, Walter Daems{1}, Jan Steckel{1}
{1}FTI Cosys-Lab, University of Antwerp, Belgium; {2}University of Antwerp, Belgium

11:15
1113: EMG-Based Human Motion Analysis: A Novel Approach Using Towel Electrodes and Transfer Learning
Chenyu Tang, Wentian Yi, Jong Min Kim, Luigi G. Occhipinti
University of Cambridge, United Kingdom

11:30
1209: Implantable Sensors and Biosensors to Monitor Bone Regeneration - Wireless Smart System for On-Line Monitoring of pH, Temperature, Strain Sensors and TGF?1 During Bone Healing
Elena Guerrero SanVicente{2}, Cédric Hennemann{1}, Jérémy Disser{1}, Ruta Grinyte{2}, Nenad Marjanović{1}, Joan Cabot{2}
{1}CSEM, Switzerland; {2}LEITAT Technological Center, Spain

11:45
1234: Wireless Bilateral Breath Monitoring System Using Temperature-Based Wearable Technology in Motion
Martina Di Leta, Alessio Mostaccio, Nicoletta Panunzio, Gaetano Marrocco
Università degli Studi di Roma Tor Vergata, Italy

10:30 - 12:00
A1L-05: Emerging Sensors for Biomedical Applications
Room: Park Suite 5
Session Chair(s): Joost Lötters, *University of Twente*

10:30
INVITED
1916: Modular Platform and Building Blocks for Sensing and Actuation in Organ-on-Chip Applications
Mathieu Odijk
University of Twente, Netherlands

11:00
1889: Remote Sensing of Exhaled Components Using Whistle Sounds
Rinka Yoshioka, Michitaka Yamamoto, Seiichi Takamatsu, Toshihiro Itoh
University of Tokyo, Japan

11:15
1640: A Smart Intra-Oral Wearable for Wireless Electroocoulogram Measurement
Han Nguyen, Sharmistha Bhadra
McGill University, Canada

11:30
1863: Application of a Photoacoustic Sensor for Colon Cancer Imaging: A Case Report
Ashkan Ghanbarzadeh-Dagheyan{2}, Francis Kalloor Joseph{2}, Cyrille Mooij{1}, Stefan van der Stel{1}, Teo Ruers{1}
{1}National Cancer Institute NKI, Netherlands; {2}University of Twente, Netherlands

11:45
1560: A Comparison of Sensing Technologies on a Room-Exit Detection System
Kaito Fukuda, Katsufumi Matsunaga, Yutaro Tabuchi, Ryutaro Ninomiya, Vasily Moshnyaga
Fukuoka University, Japan

10:30 - 12:00
A1L-06: Sensor Technologies for Sustainable Development
Room: Park Suite 6
Session Chair(s): Ravinder Dahiya, *Northeastern University*

10:30
INVITED
1921: Implantable and bioresorbable Chemical Sensors and Systems for in-Vivo Monitoring of clinical-Diagnostic Markers
Giuseppe Barillaro
Università di Pisa, Italy

11:00
1849: CRISPR-Based Diagnostic for In-Field Detection of Plant Pathogens
Amy Heathcote, Nicole Weckman
University of Toronto, Canada

11:15
1725: DTS Data Correlation Analysis for Environmental Monitoring and Infrastructure Protection
Fabien Ravet{1}, Cristian Silva{2}, Jorge Muguruza{2}, Alexandre Goy{3}, Etienne Rochat{3}, Yvan Jacquat{1}
{1}Gradesens, Switzerland; {2}Hunt LNG Operating Company, Peru; {3}Omnisens, Switzerland

11:30
1692: Stone-Based Substrates for Thin-Film Thermistor Temperature Sensors
Niloofar Saeedzadeh Khaanghah{1}, Hugo de Souza Oliveira{1}, Alejandro Carrasco-Pena{1}, Giuseppe Cantarella{2}, Michael Haller{1}, Nicholas Rapagnani{1}, Aart Van Bezooijen{1}, Michael Nippa{1}, Niko Münzenrieder{1}
{1}Free University of Bozen-Bolzano, Italy; {2}Università di Modena e Reggio Emilia, Italy

11:45
1570: Degradable Mo-Based Phosphate Sensor for In-Soil Agricultural Monitoring
Elizabeth Schell, Jack Murphy, Jon Hawkings, Alain Plante, Mark Allen
University of Pennsylvania, United States

10:30 - 12:00
A1L-07: Sensor Systems in Health Care
Room: Park Suite 7
Session Chair(s): Chang-hee Won, *Temple University*

10:30
INVITED
1913: Sim2real Approaches for Multi-Modal Robot Sensors and Sensor Skins
Hubert Zangl{2}, Serkan Ergun{1}, Tobias Mitterer{1}
{1}University of Klagenfurt, Austria; {2}University of Klagenfurt, AAU SAL Ubiquitous Sensing Lab, Austria

11:00
1622: Novel Handheld Hair Texture-Scanner Capable of Acquiring Delicate Haptic Changes in Human Hair
Masahito Komatsubara{1}, Gakuto Tanaka{1}, Satoshi Hisayasu{1}, Takaya Ohishi{1}, Yusaku Maeda{2}, Hirotoshi Oikaze{3}, Yasunori Matsui{3}, Hidekuni Takao{1}
{1}Kagawa University, Japan; {2}Kagawa University, National Institute of Technology KOSEN, Kagawa College, Japan; {3}Panasonic, Japan

11:15
1196: 3D-Printer-Based Test-Bench for Contactless Respiratory Monitoring Systems
Marco Pogliano, Irene Buraioli, Alessandro Sanginario, Danilo Demarchi, Paolo Motto Ros
Politecnico di Torino, Italy

11:30
1528: Bio-Inspired Gesture Recognition with Baffled Transducers Using Temporal and Spectral Features
Dennis Laurijssen{1}, Anthony Schenck{3}, Girmi Schouten{3}, Robin Kerstens{3}, Sebastiaan Aussems{3}, Eric Paillet{3}, Randy Gomez{2}, Keisuke Nakamura{2}, Walter Daems{1}, Jan Steckel{1}
{1}FTI Cosys-Lab, University of Antwerp, Belgium; {2}Honda Research Institute, Japan; {3}University of Antwerp, Belgium

11:45
1572: Signal Decomposition Method with Sensor-Fusion for Reducing Motion Artifacts in Intra-Oral EEG
Shibam Debbarma, Sharmistha Bhadra
McGill University, Canada

10:30 - 12:00
A1L-08: Chemical, Electrochemical and Gas Sensors - 1
Room: Park Suite 8
Session Chair(s): Xiaoshan Zhu, *Universityof Nevada Reno*
Hamida Hallil Abbas , *Bordeaux University*

10:30
INVITED
1912: Materials Design for High Performance of Metal Oxide Semiconductor Gas Sensors
Kengo Shimanoe, Koichi Suematsu, Ken Watanabe
Kyushu University, Japan

11:00
1834: Performance of a Monolithic E-Nose Array Integrating MEMS and ALD Processing
Yilu Zhou{1}, James Dieffenderfer{1}, Erdem Sennik{1}, Mahaboobbatcha Aleem{1}, Jakob Speight{1}, Shrey Vasisht{1}, Ömer Oralkan{1}, Bongmook Lee{2}, Veena Misra{1}
{1}North Carolina State University, United States; {2}State University of New York Polytechnic Institute, United States

11:15
1804: Pristine, Au and Cu Decorated Nanoporous NiO Films for Selective CO and NO2 Gas Sensing
Tesfalem Welearegay{3}, Johannes Glöckler{2}, Marta Padilla{1}, Jan Mitrovics{1}, Boris Mizaikoff{2}, Lars sterlund{3}
{1}JLM Innovation, Germany; {2}Universitt Ulm, Germany; {3}Uppsala University, Sweden

11:30
1660: Room Temperature Detection of ppb Level NO_2 by WS_2 Sensors
Shuja Bashir Malik, Fatima Ezahra Annanouch, Eduard Llobet
Universitat Rovira i Virgili, Spain

11:45
1632: Flexible Sensor Utilizing Polypyrrole Laser-Induced Graphene Nanocomposite for Room Temperature Ammonia Detection
Jose Carlos Santos-Ceballos{2}, Foad Salehnia{1}, Alfonso Romero{1}, Xavier Vilanova{1}
{1}Universitat Rovira i Virgili, Spain; {2}Universitat Rovira i Virgili, Microsystems Nanotechnologies for Chemical Analysis MINOS, Spain

10:30 - 12:00
A1L-09: Biomedical and Other Physical Sensors
Room: Park Suite 9
Session Chair(s): Dong-Weon Lee, *Chonnam National University*
Hyejin Moon, *The University of Texas at Arlington*

10:30
INVITED
1925: Self-Powered/Wireless-Powered Physical Sensors for Healthcare Applications
Inkyu Park{2}, Jungrak Choi{2}, Jimin Gu{2}, Junseong Ahn{2}, Yong Suk Oh{1}, Seokjoo Cho{2}, Hyeonseok Han{2}
{1}Korea Advanced Institute of Science & Technology, Korea; {2}Korea Advanced Institute of Science and Technology, Korea

11:00
1454: Bioimpedance as a Signature for Characterizing Human Ventricular Myocardium
Twinkle Twinkle{1}, Anil Vishnu G K{2}, Prasanna Simha Mohan Rao{3}, Hardik Jeetendra Pandya{1}
{1}Indian Institute of Science, India; {2}Indian Institute of Science, Bangalore, India; {3}Sri Jayadeva Institute of Cardiovascular Sciences and Research, India

11:15
1820: Thermoelectrical Characterization of Cells Using a Pyroelectric Sensor
Salvatore Andrea Pullano{1}, Marta Greco{1}, Syed Kamrul Islam{2}, Antonino S. Fiorillo{1}
{1}Università degli studi Magna Græcia di Catanzaro, Italy; {2}University of Missouri, United States

11:30
1593: Non-Contact Monitoring of Kiwifruit Ripening Using a High-Sensitivity Multi-Frequency Inductive Sensor
Hana Boukharouba{1}, Alexiane Pasquier{1}, Yohan Le Diraison{2}, Stéphane Serfaty{2}, Pierre-Yves Joubert{3}
{1}C2N, Université Paris Saclay, France; {2}SATIE, CY Cergy Paris Université, France; {3}Université Paris Saclay, France

11:45
1718: Capacitive Sensor for Flame Detection in Pipes
Sebastian Fizek, Markus Speletz, Florian Poltschak
Johannes Kepler Universität Linz, Austria

12:00 - 13:30
Lunch
Room: Restaurant LENZ & Selleny´s Bar

13:30 - 15:30
WiSe Speaker Session
Room: Park Suite 9
Session Chair(s): Veda Sandeep Nagaraja, *Tyndall National Institute*
Shawana Tabassum, *The University of Texas at Tyler*
Saakshi Dhanekar, *Indian Institute of Technology, Jodhpur*

13:30 - 15:30
Industry Session
Room: Green Room 1
Session Chair(s): Chonggang Wang, *Columbia University*

13:30 - 15:30
A2P-10: Sensor Phenomenology, Modeling and Evaluation - A
Room: Grand Klimt Hall
Session Chair(s): Tao Li, *University of Cincinnati*

1074: A Disturbance Observer-Based Technique to Achieve System Modeling and Parameter Identification of Micro Heater
Jiuwu Hui, Wei Xu, Yi-Kuen Lee
Hong Kong University of Science and Technology, Hong Kong

1464: Analysis of Charge Accumulation Effect in Micro-Shell Resonator Gyroscope
Ming Ze Gao, Jiang Kun Sun, Sheng Yu, Jun Feng, Yong Meng Zhang, Xue Zhong Wu, Ding Bang Xiao
National University of Defense Technology, China

1545: Mitigation of Electrical/Ionic Interference in Iontronic Neurostimulation/Neurosensing Platforms: A Simulation Study
Jacopo Nicolini{2}, Federico Leva{2}, Pierpaolo Palestri{1}, Luca Selmi{2}
{1}Università degli Studi di Udine, Italy; {2}Università di Modena e Reggio Emilia, Italy

1810: Smart Fault Detection Approach Leveraging Soft Sensor and Model-Free Control: Application to Robot Manipulator
Heni Belgacem{3}, Atal Anil Kumar{1}, Inès Chihi{1}, Lilia Sidhom{2}
{1}FSTM, University of Luxembourg, Luxembourg; {2}University of El Manar, Tunisia; {3}University of Luxembourg, Luxembourg

1892: Comprehensive LiDAR Sensor Noise Model and Application to Texture and Object Classification Using Custom Deep Learning
Hobeom Han{1}, Sang Won Yoon{2}
{1}Hanyang University, Korea; {2}Seoul National University, Korea

1412: Can LSE Reduce Noise in Sensing Applications?
Andrea Fagnani{1}, Paolo Frigerio{1}, Marco Zamprogno{2}, Giacomo Langfelder{1}
{1}Politecnico di Milano, Italy; {2}STMicroelectronics, Italy

13:30 - 15:30
A2P-11: Sensor Materials, Fabrication and Packaging - A
Room: Grand Klimt Hall
Session Chair(s): Arum Han, *Texas A&M University*

1170: Novel Package Approach for MEMS Pressure Sensor
Luca Maggi, Marco Del Sarto, Tiziano Chiarillo, Enri Duqi, Lorenzo Baldo, Adriano Abbisogni, Filippo Daniele
STMicroelectronics, Italy

1525: Influence of Material Properties on the Performance of Highly Stretchable Pneumatic Strain Gauges
Vilma Lampinen, Anastasia Koivikko, Veikko Sariola
Tampere University, Finland

1531: Low Creep 3D-Printed Piezoresistive Force Sensor for Structural Integration
Bastian Latsch{2}, Omar Ben Dali{2}, Romol Chadda{2}, Niklas Schäfer{2}, Alexander Anton Altmann{2}, Martin Grimmer{2}, Philipp Beckerle{1}, Mario Kupnik{2}
{1}Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; {2}Technische Universität Darmstadt, Germany

1716: Strain Microsensors Based on Carbon Nanotube/Polyimide Thin Films
Marco Antonio Cen Puc, Tim de Rijk, Andreas Schander, Minerva Vargas Gleason, Walter Lang
Institute for Microsensors, Actuators and Systems IMSAS, University of Bremen, Germany

1893: Precision Temperature Control of Microsystems Using On-Package Heaters and Sensors
Mohammadreza Hajipour, Fatemeh Eshaghi, Mikhail Kanygin, Behraad Bahreyni
Simon Fraser University, Canada

13:30 - 15:30
A2P-12: Chemical, Electrochemical and Gas Sensors - A
Room: Grand Klimt Hall
Session Chair(s): Xiaoshan Zhu, *Universityof Nevada Reno*
Hamida Hallil Abbas , *Bordeaux University*

1083: Design and Evaluation of a Miniaturized Non-Resonant Photoacoustic CO2 Gas Sensor with Integrated Electronics
Ananya Srivastava{1}, Nan Zhang{4}, Xiaolin Li{3}, Yuanchun Li{3}, Zhenyue Zhou{3}, Achim Bittner{1}, Xiaofeng Zhou{4}, Alfons Dehé{2}
{1}Hahn-Schickard-Gesellschaft, Germany; {2}Hahn-Schickard-Gesellschaft, Albert-Ludwigs-Universität Freiburg, Germany; {3}Hahn-Schickard-Semiconductor Tech. Co. Ltd., China; {4}Hahn-Schickard-Semiconductor Tech. Co. Ltd. / East China Normal University, China

1099: CMOS-Based Multimodal Image Sensor Enabling Simultaneous Visualization of Light and Ph
Runa Honjo, Yoshiko Noda, Daisuke Akai, Takeshi Hizawa, Yasuyuki Kimura, Yong-Joon Choi, Kazuhiro Takahashi, Kazuaki Sawada, Toshihiko Noda
Toyohashi University of Technology, Japan

1123: A SUB-Micron Double-Layer Capacitance of a Microwell Array for Avidin Sensing
Qiu-Zhe Xie, Chih-Ting Lin
Graduate Institute of Electronics Engineering, National Taiwan University, Taiwan

1146: Room Temperature Ammonia Sensor Based on Electrodeposited Polyaniline Film
Aihemaiti Kayishaer{2}, Caroline Duc{1}, Nathalie Redon{1}, Claire Magnenet{2}, Boris Lakard{2}, Sophie Lakard{2}
{1}Center for Energy and Environment, IMT Nord Europe, Institut Mines-Télécom, University of Lille, France; {2}Institut UTINAM, CNRS, Université de Franche-Comté, France

1162: Direct Electrode Modification of Paper-Based Microfluidic Sensors Through Electrodeposition and Electropolymerization
Mohammad Hossein Ghanbari, Bastian J. M. Etzold
Technische Universität Darmstadt, Germany

1180: 2D SERS Gas Sensor for Visualization and Localization of the Odor Source
Lin Chen, Cong Wang, Hao Guo, Fumihiro Sassa, Kenshi Hayashi
Kyushu University, Japan

1198: Preparation of PVP Encapsulated Pd:WO3 Nanocomposites for H2 Gas Sensing
Rubaya Yeasmin, Hyungtak Seo
Ajou University, Korea

1199: Ammonia Leakage Detection for Naval Transport - First Step Towards On-Board Detection in Presence of Water Vapour
Alexis Lasserre, Jerome Rossignol, Didier Stuerga, Leo Simon, Ludmilla Grzelak
Laboratoire Interdisciplinaire Carnot de Bourgogne, Université de Bourgogne, France

1210: Fabrication of CMOS Sucrose Image Sensor to Visualize Photosynthetic Products in Plants
Yusuke Matsushita, Taichi Yoshida, Hideo Doi, Yong-Joon Choi, Kazuhiro Takahashi, Kotaro Takayama, Kazuaki Sawada, Toshihiko Noda
Toyohashi University of Technology, Japan

1224: Polymer-Based Virtual Sensor Array Leveraging Fringing Field Capacitance for VOC Detection
Gian Carlo Antony Raj, Youssef Ezzat Elnemr, Pavithra Munirathinam, Yumna Birjis, Calvin Love, Arezoo Emadi
University of Windsor, Canada

1236: Gas Mixture Estimation Using Power-Law Models of Arrayed Chemiresistive Metal-Oxide Sensors
Ilya Gurin, Nishit Goel, Stephen Bart
TDK-InvenSense, United States

1279: NO2 Adsorption/Desorption Thermodynamics in Single Tungsten Oxide Nanowire Gas Sensors
Helena Simunkova{1}, Petr Smisitel{2}, Ondrej Chmela{2}, Stella Vallejos{3}, Jaromir Hubalek{2}
{1}Brno University of Technology, Central European Institute of Technology, Czech Rep.; {2}Central European Institute of Technology, Czech Rep.; {3}Instituto de Microelectmica de Barcelona, IMB-CNM CSIC, Spain

1335: MEMS Gas Sensors with Metal-Oxide Semiconductor Materials Patterned at Wafer-Level by Photolithography Technique
Xiaojiang Liu, Gaoqiang Niu, Jin Li, Yi Zhuang, Xitong Sun, Fei Wang
Southern University of Science and Technology, China

1371: Super-Nernstian Floating-Extended Gate Ion Sensitive Field Effect Transistor for pH Sensing
Ananya Tiwari, Sooraj Sanjay, Navakanta Bhat
Indian Institute of Science, India

1391: A Quartz Crystal Resonator Modified with a Metal-Organic Framework for Sensing of Benzene, Ethylbenzene, Toluene and Xylenes in Water
Jaskaran Singh Malhotra, Per Holger Reichert, Jonas Sundberg
Technical University of Denmark, Denmark

1400: A Terahertz Metamaterial Absorber-Based Biosensor for Ascorbic Acid
Yakai Zhang, Xiaomeng Bian, Misheng Liang, Rui You
Beijing Information Science and Technology University, China

1423: Ex-Situ Formed PANI/WS_2 Composite for Improved Selectivity Towards Ammonia Gas
Siziwe Gqoba, Zamangwane Hlongwane, Laercia Bila, Paul Fadojutimi
University of the Witwatersrand, South Africa

1877: Prevention of Biofouling on Iridium Oxide Based pH Sensors Using Polyvinyl Alcohol Hydrogels Hrishita Sharma{1}, Deepjyoti Kalita{1}, Ritik Panda{2}, Khalid B Mirza{1}
{1}National Institute of Technology, Rourkela, India; {2}NIT Rourkela, India

13:30 - 15:30
A2P-13: Biosensors and Microfluidics - A
Room: Grand Klimt Hall
Session Chair(s): Hyejin Moon, *The University of Texas at Arlington*
Uwe Schnakenberg, *RWTH Aachen University*

1003: Low-Cost Portable Medical Device for the Detection and Quantification of Exosomes
Diego Barrettino{3}, Christoph Zumbühl{3}, Raphael Kummer{3}, Markus Thalmann{3}, Carolina Balbi{2}, Giuseppe Vassalli{2}, Rosane Moura Dos Santos{1}, Jean-Michel Sallèse{1}
{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}Istituto Cardiocentro Ticino, Switzerland; {3}Lucerne University of Applied Sciences and Arts, Hochschule Luzern, Switzerland

1028: A Thermal Microfluidic Flow Sensor Screen-Printed Onto an Ultrathin PMMA Foil
Rafael Ecker, Tina Mitteramskogler, Bernhard Jakoby
Johannes Kepler Universität Linz, Austria

1132: Estimation of Analyte's Vertical Positions Above the Surface of Nanocapacitor Array Biosensors
Daniele Goldoni, Claudio Ongaro, Leonardo Orazi, Luigi Rovati, Luca Selmi
Università di Modena e Reggio Emilia, Italy

1156: Development of a Microfluidic Platform for High-Throughput Characterization of Multiple Biophysical Properties of Single-Cell Membranes
Hongfei Yu{2}, Xiao Chen{4}, Yi Zhang{3}, Shuhao Yang{2}, Lili Gui{2}, Deyong Chen{1}, Junbo Wang{1}, Jian Chen{1}, Ke Wang{2}
{1}AIR, University of Chinese Academy of Sciences, Chinese Academy of Sciences, China; {2}Beijing University of Posts and Telecommunications, China; {3}Peking University, China; {4}University of Chinese Academy of Sciences, Chinese Academy of Sciences, China

1171: A Study on Nanostructured Substrates of a LSPR Biosensor for Sensitive Detection of α-Synuclein Amyloid Proteins
Yuuto Kimura{2}, Kotaro Kamitani{1}, Carl Frederik Werner{1}, Minoru Takeda{1}, Masayuki Fukuzawa{1}, Minoru Noda{1}
{1}Kyoto Institute of Technology, Japan; {2}Kyoto Institute of Technology, Karlsruher Institut fr Technologie, Japan

1178: Development of a Mobile Measurement System for Simultaneous Measurement of Multiple Microcantilever Based Biosensors
Kazuki Miyaoka{1}, Yuya Takahashi{1}, Carl Frederik Werner{1}, Masayuki Sohgawa{2}, Minoru Noda{1}
{1}Kyoto Institute of Technology, Japan; {2}Niigata University, Japan

1223: Analysis of Liquid Morphologies in Curved Open Microchannels
Tina Mitteramskogler{2}, Rafael Ecker{2}, Andreas Fuchsluger{2}, Thomas Wilfinger{1}, Robert Wille{3}, Bernhard Jakoby{2}
{1}Ernst Wittner GmbH, Austria; {2}Johannes Kepler Universitt Linz, Austria; {3}Technische Universitt Mnchen, Germany

1248: Electrical Recording of Effects of Chemotherapeutic Treatment on Cancer Spheroids
Maximilian Ell, Mai Thu Bui, Sonia Prado-Lpez, Gnther Zeck
Technische Universitt Wien, Austria

1292: A Conductive Hydrogel-Paper Sensor for Cell Metabolism Monitoring
Zhichao Ye{2}, Yuyang Yuan{2}, Shanshan Zhang{2}, Lu Fang{1}, Congcong Zhou{2}, Bo Liang{2}, Tianyu Li{2}
{1}Hangzhou Dianzi University, China; {2}Zhejiang University, China

1332: Development of a High-Sensitivity Printed Impedance Based Electrochemical Sensor for Detecting E. coli
Parinaz Eskandari, Alimohammad Haji Adineh, Dinesh Maddipatla, Massood Atashbar
Western Michigan University, United States

1404: Thermally Driven Sol-Gel Transition of Gelatin in a 3D-Printed Microfluidic Chip
Abdul Mohizin, Yujeong Won, Baeckkyoung Sung
KIST Europe Forschungsgesellschaft mbH, Germany

1592: Microfluidic System for Recording Fast Ion Channel Kinetics with Electrical Impedance Spectroscopy
Yuan Cao, Linhan Cheng, Oscar Liborio, Ralf Hausmann, Uwe Schnakenberg
RWTH Aachen University, Germany

13:30 - 15:30
A2P-14: Optical Sensors - A
Room: Grand Klimt Hall
Session Chair(s): Martin Cizek, *Institute of Theoretical Physics, Charles University*

1018: Analog Pyroelectric Infrared Sensor for Non-Invasive Beehive Monitoring
Herbert Aumann{1}, Antony Aumann{2}
{1}MaineBiosensors LLC, United States; {2}Northern Michigan University, United States

1024: Continuous Measurement of Individual Formaldehyde Exposure with a DIY Photometer
Lisa Petani, Markus Lorenz, Christian Pylatiuk
Karlsruher Institut fr Technologie, Germany

1032: Highly Sensitive Humidity Sensor Based on Optical Fiber Fabry-Perot Interferometer
Chen Zhu{2}, Jie Huang{1}
{1}Missouri University of Science and Technology, United States; {2}Zhejiang Lab, China

1112: A Low Power Optical Sensing System for Leaf Area Index (LAI Measurement with Dynamically Adjustable Field of View
Jonathan Larochelle, Johannes Klppel, Laura Maria Comella
Albert-Ludwigs-Universität Freiburg, Germany

1115: Noninvasive Glucose Monitoring Evaluation with Diffused Transmitted NIRS in Soft Silicone-Based Tissue Phantoms
Jongdeog Kim, Bong Kyu Kim, Chul Huh
Electronics and Telecommunications Research Institute, Korea

1141: Ambient Light Sensor with 358pW / cm^2 Equivalent Noise Floor for Behind Screen Operation
Jeffrey Raynor, Samuel Foulon, Christophe Premont, Jean-Jacques Rouger, Regis Rousset, Guillaume Marchand, Olivier LeNeel
STMicroelectronics, France; STMicroelectronics, United Kingdom

1193: Fiber Optic State of Charge Sensor for Vanadium Redox Flow Batteries
Niklas Janshen{2}, Florian Rittweger{2}, Christian Modrzynski{1}, Karl-Ragmar Riemschneider{2}, Antonio Chica Lara{3}, Thorsten Struckmann{2}
{1}DECHEMA-Forschungsinstitut, Germany; {2}Hamburg University of Applied Sciences, Germany; {3}Instituto de Tecnologa Qumica, Universitat Politcnica de Valncia-CSIC, Spain

1195: Flexible Liquid-Filled Scintillating Fibers for X-Ray Detection
Magnus Lindblom{1}, Maximilian Patzauer{1}, Ulrich Vogt{2}, Scott Wilbur{3}, Nazila Safari Yazd{1}, Kenny Hey Tow{1}, Walter Margulis{1}, sa Claesson{1}, Sven-Christian Ebenhag{1}
{1}Research Institutes of Sweden AB, Sweden; {2}Royal Institute of Technology, Sweden; {3}University of Sheffield, United Kingdom

1284: Polymer-Functionalized Fiber-Optic Optrode Towards the Monitoring of Breathing Parameters
Amaya lvarez-Jiménez, Nerea De Acha, Kontxi Aginaga-Etxamendi, Aitor Urrutia, Abin Bentor Socorro-Lemoz, Ignacio Ral Matas
Universidad Pblica de Navarra, Spain

1286: Design and Validation of a Vehicle-Mounted Near-IR 1f Wavelength Modulation Spectroscopy System for On-Road Measurements of Ambient Water Vapour in Gandhinagar-Ahmedabad, India
Shruti De{2}, Durlav Paul{2}, Kenneth T V Grattan{1}, Arup Lal Chakraborty{2}
{1}City, University of London, United Kingdom; {2}Indian Institute of Technology Gandhinagar, India

1291: Low-Cost, Portable In-Situ Spectral Analysis Sensor for Monitoring Water Contamination
Pedro D. Lopes, Camila M. Penso, Cátia F. Carneiro, Luís M. Gonçalves
Universidade do Minho, Portugal

13:30 - 15:30
A2P-15: Physical Sensors - A
Room: Grand Klimt Hall
Session Chair(s): Dong-Weon Lee, *Chonnam National University*
Hyejin Moon, *The University of Texas at Arlington*

1025: Gas Flow Rate Sensing by Curvature Change of Micro Quartz Resonators
Xiangzheng Li{2}, Ye Chang{2}, Xueyou Sun{2}, Yue Feng{2}, Weiwei Cui{1}, Hao Zhang{2}
{1}State Key Laboratory of Precision Measurements Technology and Instrument, Tianjin University, China; {2}Tianjin University, China

1049: Design and Test of MEMS Resonant Accelerometer with a Novel Die-Attach Structure
Yukun Ma{1}, Shaohang Wang{2}, Wenyi Xu{2}, Rong Zhang{2}, Fengtian Han{2}
{1}State Key Laboratory of Precision Measurement Technology and Instruments, Tsinghua University, China; {2}Tsinghua University, China

1058: Sensor Resistance Based Sensitivity Temperature Drift Tracking of Integrated 3D Hall Sensors
Dennis Krause{1}, Markus Stahl-Offergeld{1}, Markus Sand{3}, Christian Kohlbrenner{1}, Robert Weigel{2}
{1}Fraunhofer Institute for Integrated Circuits IIS, Germany; {2}Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; {3}LZE GmbH, Germany

1082: Development of Power Divider in 28 GHz Band Using Si Semiconductor Process
Gapseop Sim{2}, Woojin Yun{3}, Chung-Mo Yang{3}, Choul-Young Kim{1}
{1}Chungnam National University, Korea; {2}Chungnam National University, National NanoFab Center, Korea; {3}National NanoFab Center, Korea

1100: Measurement of the Ultrasound Induced Temperature Change in an Ultrasonic Assisted Silver Sintering Process
Steffen Hadeler{2}, Yangyang Long{1}, Jens Twiefel{1}, Marc Christopher Wurz{2}
{1}Institute of Dynamics and Vibration Research, Leibniz University Hannover, Germany; {2}Institute of Micro Production Technology, Leibniz University Hannover, Germany

1101: Sensor Inserts on Spherical Surfaces for Temperature Measurement in Wear Contacts
Selina Raumel{2}, Marc Christopher Wurz{1}
{1}Institute of Micro Production Technology, Leibniz University Hannover, Germany; {2}Leibniz Universität Hannover, Germany

1109: Conformable Thin-Film Temperature Sensors on Heat-Shrinkable Substrate for Irregular Surfaces
Federica Catania{1}, Albert Heinrich Lanthaler{1}, Alejandro Carrasco-Pena{1}, Giuseppe Cantarella{2}, Niko Münzenrieder{1}
{1}Free University of Bozen-Bolzano, Italy; {2}Università di Modena e Reggio Emilia, Italy

1116: High Performance Bidirectional Thermal Gas Flow Sensor of (100) Silicon Single-Sided Fabrication by 45°-Tilted Dicing
Yan Zhang{1}, Dongcheng Xie{1}, Yujie Yang{2}, Ruichen Liu{2}, Chong Xing{2}, Feng Xue{2}, Dongliang Chen{2}, Lei Xu{1}
{1}Micro Nano Sensing Hefei Technology Co., Ltd., China; {2}University of Science and Technology of China, China

1267: Design, Fabrication, and Test of 4H-SiC Accelerometer
Yu Yang, You Zhao, Lukang Wang, Yabing Wang, Yulong Zhao
Xi'an Jiaotong University, China

1276: Suppressing Damping in a Diamagnetically Levitated Dielectric Sphere via Charge Neutralization
Xunmin Zhu{1}, Tong Wu{1}, Jing Yang{1}, Zhiming Chen{1}, Leilei Guo{1}, Huizhu Hu{2}, Zhenhai Fu{2}, Cuihong Li{1}
{1}Zhejiang Lab, China; {2}Zhejiang Lab, Zhejiang University, China

1285: 3D-Printed Strain Gauges Based on Conductive Filament for Experimental Stress Analysis
Romol Chadda, Omar Ben Dali, Bastian Latsch, Esan Sundaralingam, Mario Kupnik
Technische Universität Darmstadt, Germany

1295: Self-Powered Pressure Sensor Based on Flexible Magnetic Material
Chengxi Guo{1}, Lijie Kong{1}, Yian Chen{1}, Yuan Jiang{1}, Qinyan Zhang{1}, Xilin Qian{1}, Yifeng Li{1}, Jianqiu Huang{2}, Huiyang Yu{1}
{1}Nanjing Tech University, China; {2}Southeast University, China

1313: Design and Optimization of a Soft Magnetic Tactile Sensor
Chengjin Du, Federico Bernabei, Matteo Lo Preti, Lucia Beccai
Istituto Italiano di Tecnologia, Italy

1337: Flexible Ag-Nanowire-Doped PEDOT:PSS Split Ring Resonator for Liquid Detection
Marzieh Dordanihaghighi{1}, Ali Maleki Gargari{1}, Mahmoud Wagih{2}, Mohammad Arjmand{1}, Mohammad H. Zarifi{1}
{1}University of British Columbia, Canada; {2}University of Glasgow, United Kingdom

1348: A Resonant Pressure Microsensor Optimized by DETF Resonators
Xingyu Li{1}, Bo Xie{1}, Yulan Lu{1}, Junbo Wang{2}, Deyong Chen{2}, Jian Chen{2}, Nan Li{1}, Xiaoye Huo{1}
{1}Aerospace Information Research Institute, Chinese Academy of Sciences, China; {2}AIR, University of Chinese Academy of Sciences, Chinese Academy of Sciences, China

13:30 - 15:30
A2P-16: Acoustic and Ultrasonic Sensors - A
Room: Grand Klimt Hall
Session Chair(s): Hongyu YU, *Hong Kong University of Science and Technology*
Haifeng Zhang, *University of North Texas*

1125: Method for Enhancing Transduction of Antisymmetric Lamb Waves
Sunghyun Kim{2}, Hyung Jin Lee{1}, Yoon Young Kim{2}
{1}Korea Research Institute of Standards and Science KRISS, Korea; {2}Seoul National University, Korea

1131: High-Accuracy Dry-Bulb Temperature Sensing with Short-Time Fourier Transform (STFT) Using PSON pMUTs
Mantalena Sarafianou{1}, Nai Liang Hii{2}, David Sze Wai Choong{1}, Duan Jian Goh{1}, Yul Koh{1}
{1}Institute of Microelectronics, Agency for Science, Technology and Research, Singapore; {2}SiT, Digipen Institute of Technology, IME, Agency for Science, Technology and Research, Singapore

1138: A Pulse Wave Velocity Estimation Method for a Wearable Monitoring Device: Feasibility and Preliminary Experimental Results
Paolo Mattesini{3}, Marco Travagliati{2}, Claudio Simeone{1}, Leonardo Baldasarre{2}, Stephen Bart{2}, Alessandro Ramalli{3}
{1}Efesys S.r.l., Italy; {2}TDK-InvenSense, United States; {2}TDK-InvenSense, Italy; {3}Università degli Studi di Firenze, Italy

1140: Detecting and Classifying Bio-Inspired Artificial Landmarks Using In-Air 3D Sonar
Maarten de Backer{2}, Wouter Jansen{3}, Dennis Laurijssen{2}, Ralph Simon{1}, Walter Daems{2}, Jan Steckel{2}
{1}Behavioural Ecology and Conservation Lab, Nuremberg Zoo, Germany; {2}FTI Cosys-Lab, University of Antwerp, Belgium; {3}University of Antwerp, Belgium

1175: Iterative Analysis Approach Using Interactive Python-FEM to Estimate the Residual Stresses in PMUTs
Prakasha Chigahalli Ramegowda{1}, David Sze Wai Choong{1}, Duan Jian Goh{1}, Liu Jihang{1}, Srinivas Merugu{1}, Peter Hyun Kee Chang{1}, Alberto Leotti{2}, Domenico Giusti{2}, Carlo Prelini{2}, Sagnik Ghosh{1}, Joshua En-Yuan Lee{1}, Yul Koh{1}
{1}Institute of Microelectronics, Agency for Science, Technology and Research, Italy; {1}Institute of Microelectronics, Agency for Science, Technology and Research, Singapore; {2}STMicroelectronics, Singapore; {2}STMicroelectronics, Italy

2024: Millimeter-Scale Leak Detection Using Distributed Acoustic and Temperature Gradient Sensing
Guilherme Heim Weber{3}, Danilo Fernandes Gomes{3}, Eduardo Nunes Dos Santos{3}, Ana Luiza Beltrão Santana{3}, Jean Carlos Cardozo Da Silva{3}, Cicero Martelli{3}, Daniel Rodrigues Pipa{3}, Rigoberto E. M. Morales{3}, Sérgio Taveira de Camargo Júnior{2}, Manoel Feliciano Da Silva{2}, Marco Jose Da Silva{1}
{1}Johannes Kepler Universität Linz, Austria; {2}Petrobras Research and Development Program, Brazil; {3}Universidade Tecnológica Federal do Paraná, Brazil

13:30 - 15:30
A2P-17: Sensor Networks and IOT - A
Room: Grand Klimt Hall
Session Chair(s): Domenico Balsamo, *Newcastle University*
Yacine GHAMRI-DOUDANE, *La Rochelle University*

1052: Model-Based Sensor-Fault Detection and Isolation in Natural-Gas Pipelines for Transient Flow
Khadija Shaheen{1}, Apoorva Chawla{1}, Ferdinand Evert Uilhoorn{2}, Pierluigi Salvo Rossi{1}
{1}Norwegian University of Science and Technology, Norway; {2}Warsaw University of Technology, Poland

1280: High-Precision Time-Frequency Synchronization for Mobile Distributed Coherent Systems
Xiye Guo, Suyang Liu, Zhijun Meng, Kai Liu, Enqi Yan
National University of Defense Technology, China

1633: Advancing Urban Air Quality Monitoring: A Hybrid Mobile-Stationary Approach
Yurii Tsyban, Eckaard Le Roux, Aiman Fakieh, Ibrahim Hoteit, Khaled Nabil Salama
King Abdullah University of Science and Technology, South Africa; King Abdullah University of Science and Technology, Egypt; King Abdullah University of Science and Technology, Ukraine; King Abdullah University of Science and Technology, Saudi Arabia

1773: Wireless Sensor Network Powered with Data Analytics for Small Hydro Reliability Enhancement
Fabien Ravet{1}, Didier Nicoulaz{1}, Yvan Jacquat{1}, Cédric Morier{2}, Nicolas André{2}
{1}Gradesens, Switzerland; {2}Société Electrique des Forces de l'Aubonne SA, Switzerland

1805: How Challenging Is It to Design a Practical Superdirective Antenna Array?
Stylianos Assimonis
Queen's University Belfast, United Kingdom

1008: Impedance Tomographic Sensor for Monitoring Bioprinted Cell Cultures
Kaue Morcelles, Pedro Bertemes-Filho
State University of Santa Catarina, Brazil

13:30 - 15:30
A2P-18: Emerginging Sensors in Biomedical Applcations - A
Room: Grand Klimt Hall
Session Chair(s): Mark Cheng, *The University of Alabama*

1034: On the Road to the Development of Noninvasive Highly Sensitive Electromagnetic Bio-Sensor for Bone Crack Detection
Ravi Anand, Debarati Dutta, Anirban Sarkar
Indian Institute of Technology Mandi, India

1053: Real-Time Hyperspectral Imaging for Non-Invasive Monitoring of Tissue Ischemia
Anoek Strumane{1}, Jens De Winne{1}, Danilo Babin{1}, Jan Aelterman{1}, Hiep Luong{1}, Wilfried Philips{2}
{1}Ghent University, Imec, Belgium; {2}TELIN-IPI, Ghent University - imec, Belgium

1241: Magnetic Imaging of Thimble Tube Using Integrated Array TMR Sensors
Jingyi Wang{2}, Xiaoguang Li{1}, Ming Li{1}, Chaofeng Ye{2}
{1}CGNPC Inspection Technology Co., Ltd., China; {2}ShanghaiTech University, China

1595: A 3D Printed Sensor Based on Microwave Transversal Signal Interference Principle with Simultaneous Angular Displacement and Inclination Detection
Desen Li, Chi-Hou Chio, Kam-Weng Tam
University of Macau, Macau

1780: A Flexible Inductive Sensor for Non-Invasive Arterial Pulse Measurement
Nimal Jagadeesh Kumar{2}, Alexander Johnson{2}, Robert Cobden{2}, George Valsamakis{2}, Gene Gristock{2}, Arash Pouryazdan{2}, Daniel Roggen{2}, Niko Münzenrieder{1}
{1}Free University of Bozen-Bolzano, Italy; {2}University of Sussex, United Kingdom

1845: Low Power Flexible Sensor for Ambient Light-Based Blood Oxygen Saturation Measurement
Hossein Anabestani, Shahab Mahmoudi Sadaghiani, Sharmistha Bhadra
McGill University, Canada

1620: Low-Cost Sweating-Rate Sensor for Dehydration Monitoring in Sports
Andrea Ria{2}, Massimo Piotto{2}, Xavier Muñoz-Berbel{1}, Paolo Bruschi{2}, Michele Dei{2}
{1}Institute of Microelectronics of Barcelona, Spain; {2}Università di Pisa, Italy

13:30 - 15:30
A2P-19: Sensor Systems - A
Room: Grand Klimt Hall
Session Chair(s): Chang-hee Won, *Temple University*

1030: A ZPM-Based Resistive Sensor Array Readout System with a Novel Compensation Method
Fabian Näf{2}, Diogo Miguel Bárbara Caetano{1}, Susana Cardoso{1}, Gonçalo Nuno Tavares{3}
{1}INESC MN, Instituto Superior Técnico, Universidade de Lisboa, Portugal; {2}INESC-ID, INESC MN, Instituto Superior Técnico, Portugal; {3}INESC-ID, Instituto Superior Técnico, Universidade de Lisboa, Portugal

1110: Compact Low Noise AC Acquisition System for Wheatstone Bridge Sensors
Fabian Näf{3}, Pedro Ribeiro{2}, Gonçalo Nuno Tavares{4}, Lorenzo Jamone{1}, Susana Cardoso{2}
{1}Advanced Robotics at Queen Mary ARQ, United Kingdom; {2}INESC MN, Instituto Superior Técnico, Universidade de Lisboa, Portugal; {3}INESC-ID, INESC MN, Instituto Superior Técnico, Portugal; {4}INESC-ID, Instituto Superior Técnico, Universidade de Lisboa, Portugal

1148: Alleviating Slot Collisions in UHF RFID Systems
Hamed Salah, Georgi Gaydadjiev
University of Groningen, Netherlands

1217: Improved Signal Processing Algorithm to Enhance the Performance of Electrostatic Sensors for Particle Velocity Measurement
Kamel Reda{2}, Tao Wang{2}, Yong Yan{1}
{1}University of Kent, United Kingdom; {2}Walsn Limited, United Kingdom

1317: A Constant Fraction Discriminator with Shape-Agnostic Fraction Triggering and Sub-Ns Walk for the Solar Probe Analyzer for Ions
Lydia Lee{2}, Robert Abiad{1}, Roberto Livi{1}, Mia Mirkovic{2}, Kenneth Hatch{1}, Hilary Brunner{1}, Davin Larson{1}, Kristofer Pister{2}
{1}Space Sciences Laboratory, University of California, Berkeley, United States; {2}University of California, Berkeley, United States

1344: A Linear Non-Contact Measurement of Dielectric Thickness with µm-Resolution
Surbhika Rastogi, Surya Varchasvi Devaraj, Rajesh Zele
Indian Institute of Technology Bombay, India

1373: Pilot Study: Response of a Piezoelectric Polymer Based Sensing System to Indentation
Mohamad Yaacoub{2}, Yahya Abbass{1}, Christian Gianoglio{1}, Lucia Seminara{1}, Maurizio Valle{1}
{1}Università degli studi di Genova, Italy; {2}Università di Genova, Italy

1405: Vehicle Detection Device Using 2-Axis Magneto-Impedance Sensors for Traffic Monitoring
Ruixuan Yao, Tsuyoshi Uchiyama
Nagoya University, Japan

1119: Enhancing DF-INS for Accurate Zero-Velocity Detection in ILBS: A Dual Foot Synergistic Method
Renjie Wu, Boon Giin Lee, Matthew Pike, Linzhen Zhu, Xiaoqing Chai, Yongfu Wang
University of Nottingham Ningbo China, China

1130: Gas Prediction Method Based on Dynamic Response Analysis of Metal Oxide Sensors Under Temperature Modulation
Ya-Han Fan{2}, Ting-I Chou{2}, Shih-Wen Chiu{1}, Kea-Tiong Tang{2}
{1}Enosim Bio-tech Co., Ltd., Taiwan; {2}National Tsing Hua University, Taiwan

1190: Algorithm-Aware Digital Design for Analog-on-Top Chips: An ASK Demodulator Comparative Study
Felice Tecce{1}, Matteo Abate{2}, Francesco Del Prete{1}, Giovanni Amedeo Cirillo{1}, Claudio Parrella{1}, Marco Castellano{2}
{1}STMicroelectronics, Italy; {2}STMicroelectronics, AMS R&D, Italy

1355: A Quadrature Phase-Locked Loop Based Digital Closed-Loop System for MEMS Resonant Sensors
Mengyang Zhou{1}, Jiahui Yao{1}, Yulan Lu{1}, Bo Xie{1}, Junbo Wang{2}, Deyong Chen{2}, Jian Chen{2}, Xiaoye Huo{1}, Nan Li{1}
{1}Aerospace Information Research Institute, Chinese Academy of Sciences, China; {2}AIR, University of Chinese Academy of Sciences, Chinese Academy of Sciences, China

1417: Noise and Gaussian Clutter Background Descending Dimensional Subspace Signal Detector
Zhan Zhou{2}, Guangfen Wei{2}, Xu Liu{2}, Yuan Luo{2}, Tao Jian{1}
{1}Naval Aeronautical University, China; {2}Shandong Technology and Business University, China

1637: Linearization of Giant Magnetoimpedance Sensors Using a Logarithmic Amplifier
Marvin Sandner, Marcus Prochaska, Phil Meier
Ostfalia University of Applied Sciences, Germany

1683: A Cognitive Sensor System Architecture for the Monitoring of Flexible Machining Systems
Lukas Krupp{1}, Christian Wiede{1}, Joachim Friedhoff{2}, Anton Grabmaier{1}
{1}Fraunhofer Institute for Microelectronic Circuits and Systems IMS, Germany; {2}University of Applied Sciences Ruhr West, Germany

1709: Development of a Robust Vision-Based Interstory Deformation Sensing Method Using a Kernelized Correlation Filter
Keito Tamura, Michitaka Yamamoto, Seiichi Takamatsu, Toshihiro Itoh
University of Tokyo, Japan

1647: Quantitative Evaluation of a Multi-Modal Camera Setup for Fusing Event Data with RGB Images
Julian Moosmann, Jakub Mandula, Philipp Mayer, Luca Benini, Michele Magno
ETH Zürich, Switzerland

1669: Distributed Blind Equalization with Block-Adaptive Approach on Wireless Sensor Network
Sulin Chi, Yosuke Sugiura, Tetsuya Shimamura
Saitama University, Japan

1809: Near-Zero-Power Passive Wireless Underground Soil Moisture Sensor
Sheng Ding{1}, Shad Roundy{1}, Ramesh Goel{1}, Cody Zesiger{2}, Darrin J Young{1}
{1}University of Utah, United States; {2}Utah State University, United States

13:30 - 15:30
A2P-20: Sensors and Wireless Power Systems
Room: Grand Klimt Hall
Session Chair(s): Hongsoo Choi, *Daegu Gyeongbuk Institute*
Smitha Rao, *Michigan Technological University*

1205: An Energy-Efficient Current Measurement Method for Wireless Sensors
Dailys Arronde Pérez{1}, Narendiran Anandan{1}, Hubert Zangl{2}
{1}University of Klagenfurt, Austria; {2}University of Klagenfurt, AAU SAL Ubiquitous Sensing Lab, Austria

1378: Electrodynamic Wireless Power and Data Transfer for Implanted Medical Devices
Christian Barrett{2}, Hailing Fu{1}, Stephanos Theodossiades{3}
{1}Beijing Institute of Technology, China; {2}Loughborough University, United Kingdom; {3}Wolfson School of Mechanical, Electrical and Manufacturing Engineering, Loughborough University, United Kingdom

1379: Actuation and Sensing for PZT Micromirrors Using Using d_{33} Mode Directional Interdigitated Electrodes
Pooja Thakkar, Anton Lagosh, Madeleine Petschnigg, Dominik Holzmann, Jaka Pribošk
Silicon Austria Labs GmbH, Austria

1860: A Three-Phase Rotating Magnet Electrodynamic Wireless Power Transmission Receiver
Vernon Crasto, Matthew Stormant, David Arnold
University of Florida, United States

13:30 - 15:30
A2P-21: Sensor Data Processing & AI - A
Room: Grand Klimt Hall
Session Chair(s): Theerawit Wilaiprasitporn, *Vidyasirimedhi Institute of Science & Technology*

1045: Determining Misalignment State of Automotive Radar Sensor Using DNN
Junho Kim{1}, Chanul Park{1}, Seongwook Lee{1}, Taewon Jeong{2}
{1}Chung-Ang University, Korea; {2}Korea Aerospace University, Korea

1191: Bayesian Optimisation of Existing Object Detection Methods for New Contexts
Tim Willems{1}, Jan Aelterman{2}, David Van Hamme{3}
{1}Ghent University, Belgium; {2}Ghent University, Imec, Belgium; {3}TELIN-IPI, Ghent University - imec, Belgium

1201: On Orientation Distribution Representations with Reliable Uncertainties in Inertial Motion Tracking
Ganesh Shrinivas Koparde{1}, Bertram Taetz{2}, Didier Stricker{1}
{1}Deutsches Forschungszentrum für künstliche Intelligenz GmbH, Germany; {2}International University of Applied Sciences, University of Applied Sciences Erfurt, Germany

1230: Towards Low-Cost Plastic Recognition Using Machine Learning and Multi-Spectra Near-Infrared Sensor
Gregory West, Tareq Assaf, Uriel Martinez-Hernandez
University of Bath, United Kingdom

1252: On-Demand Provisioning of Wearable Sensors Data Processing Services in Edge Computing
Lionel Nkenyereye{1}, Boon Giin Lee{2}, Kentaro Go{3}, Xiaoyang Mao{3}, Wan-Young Chung{1}
{1}Pukyong National University, Korea; {2}University of Nottingham Ningbo China, China; {3}University of Yamanashi, Japan

1272: Wavelet Transform Algorithm for Eigenfrequency Detection in a Piezoelectric Parity-Time Symmetric System
Ying Li, Zhenyu Wei, Jianqiu Huang
Southeast University, China

1302: Triple-Sensing with an Ion-Sensitive-Field-Effect-Transistor via Machine-Learning Algorithm
Sheng-Yu Chen{2}, Yi-Ting Wu{2}, Wei-En Hsu{2}, Chih-Ting Lin{1}
{1}Graduate Institute of Electronics Engineering, National Taiwan University, Taiwan; {2}National Taiwan University, Taiwan

1364: Extract Spatial Distribution of a Specific Gas from Mixed Gas Data Measured by the LSPR Gas Sensor
Xiaofan Zheng, Masato Matsuoka, Kenshi Hayashi, Yoichi Tomiura
Kyushu University, Japan

1388: Early Detection of Faillure in Conveyor Chain Systems by Wireless Sensor Node
Ghada Bouattour, Lidu Wang, Sajidah Al-Hammouri, Jiachen Yang, Christian Viehweger, Olfa Kanoun
Technische Universität Chemnitz, Germany

1443: Comparing Data Representation Techniques for Tactile Sensing in Classification Tasks
Venkata Danyamraju, Tahsin Prottoy, S M Jobayer, Vinicius Prado Da Fonseca
Memorial University of Newfoundland, Canada

1445: Shallow Hierarchical CNN–LSTM for Activity Recognition to Integrate Postural Transition States
Douglas Tilley, Uriel Martinez-Hernandez
University of Bath, United Kingdom

1548: Non-Invasive Monitoring of Swallowing Function Using Multi-Channel Auscultation
Ziyuan Yin{2}, Marc Wong{1}, Chuanlin Lan{2}, Sunny Wong{3}, Rosa Chan{2}
{1}Chinese University of Hong Kong, Hong Kong; {2}City University of Hong Kong, Hong Kong; {3}Nanyang Technological University, Singapore

1571: A Self-Supervised Parking Spot Monitoring System Using Google Coral Edge TPU
Dawson Drake, Wei Tang
New Mexico State University, United States

1701: The Heterogeneity-Intensified and Heterogeneity Ratio-Stratified Bootstrap (HiS- and HeRS-Boot) Oversampling to Boost a Detector Performance
Pertami J. Kunz, Syrine Ben Abid, Abdelhak Zoubir
Technische Universität Darmstadt, Germany

1713: Current and Stray Flux Sensors for Anomaly Detection in PMSM Drive Based on Gradient Boosting Machine
Nam Du Hoang Nguyen, Van Khang Huynh, Kjell Gunnar Robbersmyr
University of Agder, Norway

1777: DipSAR: Deep Image Prior for Sparse Sampled Near-Field SAR Millimeter-Wave Imaging
Rawin Assabumrungrat{3}, Nakorn Kumchaiseemak{4}, Jianping Wang{1}, Dingyang Wang{1}, Phoom Punpeng{2}, Francesco Fioranelli{1}, Theerawit Wilaiprasitporn{4}
{1}Delft University of Technology, Netherlands; {2}Ruamrudee International School, Thailand; {3}Tohoku University, Japan; {4}Vidyasirimedhi Institute of Science and Technology, Thailand

1808: Probabilistic Fusion of Depth Maps with Local Variance Estimation
Henry Schaub, Nico Leuze, Maximilian Hoh, Alfred Schöttl
University of Applied Science Munich, Germany

1055: Optimizing Spatial Sensing Performance with Kriging and SRGAN – A Feasibility Study
Roe Djer Tan{2}, Omkar Patade{2}, Huaxia Wang{2}, Chulho Yang{2}, Dongchan Lee{1}
{1}Institute for Advanced Engineering, Korea; {2}Oklahoma State University, United States

1179: HeartRhythm: ECG-Based Music Preference Classification in Popular Music
Phairot Autthasan{2}, Petchkla Sukontaman{1}, Theerawit Wilaiprasitporn{2}, Soravitt Sangnark{2}
{1}Ruamrudee International School, Thailand; {2}Vidyasirimedhi Institute of Science and Technology, Thailand

13:30 - 15:30
A2P-22: Wearable Sensors and Systems - A
Room: Grand Klimt Hall
Session Chair(s): Sahika Inal, *King Abdullah University of Science and Technology (KAUST)*
Jürgen Kosel, *Silicon Austria Labs (SAL)*

1046: A Wearable Solution for Obstructive Sleep Apnea Risk Evaluation Based on Optical Sensor
Chih Hao Wang, Shih Jen Lu, Yang Ming Chou, Chien Yi Kao, Hsin Yi Lin
PixArt Imaging Inc., Taiwan

1057: Flexible Mesostructured Capacitive Pressure Sensor for Blood Pressure Monitoring
Shubham Kumar, Sanjay Yadav, Ashok Kumar
CSIR National Physical Laboratory of India, India

1106: GaitSkin System: Wireless Vibrotactile Skin Patch with Gait Tracker for Sensorimotor Conflict Creation
Emilio Fernández-Lavado{2}, Selim Habiby Alaoui{1}, Haotian Chen{2}, Ivan Furfaro{2}, Bruno Herbelin{1}, Olaf Blanke{1}, Stéphanie P. Lacour{2}
{1}LNCO, Neuro-X Institute, École Polytechnique Fédérale de Lausanne, Switzerland; {2}LSBI, Neuro-X Institute, École Polytechnique Fédérale de Lausanne, Switzerland

1207: Evaluation of Expandable Microsphere Pressure Sensor for Arterial Pulse Wave Measurements
Natalia Kanko, Antti Vehkaoja, Mikko Peltokangas, Matti Mäntysalo
Tampere University, Finland

1411: Wearable Haptic Braille Device for Enhancing Classroom Learning
Chinmay Sultania, Divyansh Singhal, Mayank Kabra, Anshul Madurwar, Soham Pawar, Madhav Rao
International Institute of Information Technology Bangalore, India

13:30 - 15:30
A2P-23: Sensors in Industrial Practices - A
Room: Grand Klimt Hall
Session Chair(s): Jürgen Kosel, *Silicon Austria Labs (SAL)*

1380: Enhancing Positioning Sensor Applications: Online Harmonic Order Determination of Atan2 – Function
Jie Zhou, Markus Dietrich, Florian Zeller, Wai-Wai Buchet
Schaef?er Automotive Buehl GmbH & Co. KG, Germany

1710: A 145-µW Always-on Touch Screen Readout and Always-on Haptic Driver IC for 1.26-Inch Circular Display of Wearable Device
Junmin Lee, Juwon Ham, Wooseok Jang, Hamin Lee, Jongmin Oh, Sangmo Goo, Seunghoon Ko
Kwangwoon University, Korea

13:30 - 15:30
A2P-24: Live Demonstration of Sensors and Sensing Technologies - A
Room: Grand Klimt Hall
Session Chair(s): Anna Grazia Mignani, *CNR-Institute of Applied Physics 'Nello Carrara', Florence Italy*
Calogero Maria Oddo, *Sant'Anna School of Advanced Studies, Pisa, Italy*

1639: Live Demonstration: A LED-Based Pocket-Size and Low-Cost Fluorometer
Andrea Azelio Mencaglia, Leonardo Ciaccheri, Barbara Adinolfi, Anna Grazia Mignani
CNR Istituto di Fisica Applicata Nello Carrara, Italy

1245: Live Demonstration: Coupled-Core Fiber Bragg Grating Sensors
Monserrat Alonso-Murias{1}, Daniel Maldonado-Hurtado{2}, Jose Flores-Bravo{4}, Florian Lindner{3}, Joerg Bierlich{3}, Katrin Wondraczek{3}, Salvador Sales{2}, Joel Villatoro{4}
{1}Centro de Investigaciones en Óptica A. C, Mexico; {2}ITEAM Research Institute, Universitat Politècnica de València, Spain; {3}Leibniz Institute of Photonic Technology, Germany; {4}University of the Basque Country, Spain

1269: Live Demonstration: Optical Properties of Vanadium Oxide Films
Irina Minailova
Lashkarev Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, Ukraine

1495: Live Demonstration: Holographic Fibre Endoscope for In-Vivo Deep Tissue Imaging
Sergey Turtaev, Jiri Hofbrucker, Hana Čižmárová, Patrick Westermann, Andre Gomes, Tomáš Čižmár
Leibniz Institute of Photonic Technology, Germany

1699: Live Demonstration: ORIGIN – Optical Fibre Sensors for Radiation Dose Mapping and Source Localisation During Brachytherapy
Sinead O'Keeffe, Jennifer Hanly
University of Limerick, Ireland

1909: Live Demonstration: Novel Rotary Encoder with Multi-Axis Hall Sensors
Bruno Brajon, Christian Schott, Gaël Close
Melexis Technologies SA, Switzerland

1270: Live Demonstration: Surface Plasmon's Dispersion Properties of Vanadium Oxide Films
Igor Matyash
Lashkarev Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, Ukraine

13:30 - 15:30
A2P-25: Chemical Agent Detection: Sensing Technologies and Sensing Applications - A
Room: Grand Klimt Hall
Session Chair(s): Frank Sabath, *Bundeswehr Research Institute for Protective Technologies and CBRN-Protection (WIS)*

1740: PPy & P3MT-MWCNT Nanocomposites-Based Sensors for Nerve Gas Detection at ppb Levels
Nathalie Redon{1}, Nataliia Davydenko{3}, Nikolay Ogurtsov{3}, Marina Jamar{2}, Yuriy Noskov{3}, Alexander Pud{3}, Jean-Luc Wojkiewicz{2}
{1}Center for Energy and Environment, IMT Nord Europe, Institut Mines-Télécom, University of Lille, France; {2}IMT Nord Europe, France; {3}V. P. Kukhar Institute of Bioorganic Chemistry and Petrochemistry, NAS of Ukraine, Ukraine

13:30 - 15:30
A2P-26: Smart Biomedical Sensor Platforms in Resource Constrained Settings - A
Room: Grand Klimt Hall
Session Chair(s): Shantanu Bhattacharya, *Indian Institute of Technology Kanpur*

1401: Automated Line Detection on Lateral Flow Assays: A Paradigm Shift in Rapid Diagnostic Testing
Mohammed Rashiku B C{1}, Kapil Manoharan{1}, Shubhra Gangopadhyay{2}, Shantanu Bhattacharya{1}
{1}Indian Institute of Technology Kanpur, India; {2}University of Missouri, United States

1483: Development of a Paper Based Glutathione Detection for Point of Care Low Resource Settings
Anubhuti Saha, Shiwangi Maurya, Shantanu Bhattacharya
Indian Institute of Technology Kanpur, India

13:30 - 15:30
A2P-27: Industrial Applications
Room: Grand Klimt Hall
Session Chair(s): Thilo Sauter, *TU Wien and Danube University Krems*

Sensors Letters Paper
1995: Dielectric Sensing of Mass Concentration and Moisture in Coal Powders
Thomas Suppan{1}, Markus Neumayer{1}, Thomas Bretterklieber{1}, Christoph Feilmayr{2}, Stefan Schuster{2}, Hannes Wegleiter{1}
{1}Technische Universität Graz, Austria; {2}voestalpine Stahl GmbH, Austria

Sensors Letters Paper
2076: A Fast and Improved dual-PRT Doppler Technique for Industrial Flow Metering
Fabio Rizental Coutinho{2}, Andre Luis Stakowian{2}, Marco Jose Da Silva{1}
{1}Johannes Kepler Universität Linz, Austria; {2}Universidade Tecnológica Federal do Paraná, Brazil

Sensors Letters Paper
2077: Linear Variable Differential Transformer in Harsh Environments - Analysis of Temperature Drifts for Different Plunger Materials
Gabriel Gruber, Markus Neumayer, Bernhard Schweighofer, Hannes Wegleiter
Technische Universität Graz, Austria

Sensors Letters Paper
2091: Investigation of Thermal Anemometry with Thermistor Sensing Elements for Gas Flow Measurements in Harsh Environments
Martin Schellander{1}, Bernhard Schweighofer{2}, Markus Neumayer{2}, Hannes Wegleiter{2}
{1}Graz University of Technology, Austria; {2}Technische Universität Graz, Austria

Sensors Letters Paper
2115: In-Line Monitoring of a Curing Process with a multi-Sensor Concept
Wolfgang Mühleisen{3}, Dong Yan{3}, Thorsten Wolf{1}, Markus Grinschgl{1}, Venu Prakash Kasinikota{2}, Margit Lang{2}
{1}GIPRO GmbH, Austria; {2}Polymer Competence Center Leoben GmbH, Austria; {3}Silicon Austria Labs GmbH, Austria

Sensors Letters Paper
2125: Influence of Position on Optoelectronic Strain Measurement Systems for Flywheels
Matthias Rath, Bernhard Schweighofer, Hannes Wegleiter
Technische Universität Graz, Austria

13:30 - 15:30
A2P-28: Gas Sensors
Room: Grand Klimt Hall
Session Chair(s): Thilo Sauter, *TU Wien and Danube University Krems*

Sensors Letters Paper
1991: Spatiotemporal Visualization of Gases Using 2D LSPR Gas Sensor
Masato Matsuoka, Lingpu Ge, Fumihiro Sassa, Kenshi Hayashi
Kyushu University, Japan; Kyushu University, China

Sensors Letters Paper
2046: Ammonia Gas Optical Sensor Based on Lossy Mode Resonances
Carlos Ruiz Zamarreno, Dayron Armas, Pablo Zubiate, Ignacio Raúl Matías
Universidad Pública de Navarra, Spain

Sensors Letters Paper
1989: LMR-Based Optical Sensor for Ethylene Detection at Visible and Mid-Infrared Regions
Carlos Ruiz Zamarreno, Elieser Ernesto Gallego, Mikel Hualde, Ignacio Raúl Matías
Universidad Pública de Navarra, Spain

13:30 - 15:30
A2P-29: Wearable Sensors
Room: Grand Klimt Hall
Session Chair(s): Thilo Sauter, *TU Wien and Danube University Krems*

Sensors Letters Paper
2056: Inductive Textile Sensing for Movement Monitoring
Chakaveh Ahmadizadeh, Valeria Galli, Victor Luder, Carlo Menon
ETH Zürich, Switzerland

Sensors Letters Paper
2098: Ultrafast and Low-Power Graphene Wheatstone Bridge Respiratory Sensor
Sabitha Ann Jose, Jingqin Mao, Yahya Atwa, Paul Baine, David McNeill, Hamza Shakeel
Queen's University Belfast, United Kingdom

13:30 - 15:30
A2P-30: Biosensing
Room: Grand Klimt Hall
Session Chair(s): Thilo Sauter, *TU Wien and Danube University Krems*

Sensors Letters Paper
1939: Redox Indicator-Based Electrochemical DNA Detection
Vanessa Thoeny{2}, Eva Melnik{2}, Pooyan Mehrabi{1}, Melanie Huetter{1}, Thomas Schalkhammer{1}, Thomas Maier{2}, Giorgio C. Mutinati{2}, Peter Lieberzeit{3}, Rainer Hainberger{2}
{1}Attophotonics Biosciences GmbH, Austria; {2}Austrian Institute of Technology GmbH, Austria; {3}Universität Wien, Austria

Sensors Letters Paper
1977: Demonstration of New Microelectrode Design to Enhance Sensitivity of Dielectrophoretic Impedance Measurement
Michihiko Nakano{1}, Masafumi Inaba{1}, Tomoko Murakami{2}, Maho Sakurai{2}, Junya Suehiro{1}
{1}Kyushu University, Japan; {2}Sumitomo Pharma Co. Ltd., Japan

Sensors Letters Paper
2083: Machine Learning-Assisted Analysis of Electrochemical Biosensors
Shreyas Deshpande{1}, Rishikesh Datar{2}, Bidhan Pramanick{3}, Gautam Bacher{2}
{1}Birla Institute of Technology & Science, Pilani, India; {2}Birla Institute of Technology and Science, Pilani, India; {3}Indian Institute of Technology Goa, India

Sensors Letters Paper
2108: Effect of Metallization Ratio on the Sensitivity of GC-Ides Based Immunosensor
Shreyas Deshpande{1}, Naresh Mandal{3}, Bidhan Pramanick{3}, Gautam Bacher{2}
{1}Birla Institute of Technology & Science, Pilani, India; {2}Birla Institute of Technology and Science, Pilani, India; {3}Indian Institute of Technology Goa, India

15:30 - 16:30
YP Panel Discussion
Room: Park Suite 1
Session Chair(s): Veda Sandeep Nagaraja, *Tyndall National Institute*

15:30 - 17:30
A3L-02: Advanced Modeling, Algorithm, and Machine Learning Techniques
Room: Park Suite 2
Session Chair(s): J.-C. Chiao, *SMU*
Tao Li, *University of Cincinnati*

15:30
Invited Journal Author
10.1109/JSEN.2023.3252178: A Multimodal 3-D Detector with Attention from the Corresponding Modal
Bo Tao, Fuwu Yan, Zhishuai Yin, Linzhen Nie, Mingze Miao, Yujun Jiao, Chunyuan Lei
Wuhan University of Technology, China

15:45

Invited Journal Author

10.1109/LSENS.2023.3273733: Trade-Off Between Accuracy and Computational Cost with Neural Architecture Search: a Novel Strategy for Tactile Sensing Design

Christian Gianoglio, Edoardo Ragusa, Paolo Gastaldo, Maurizio Valle
Università degli studi di Genova, Italy

16:00

Invited Journal Author

10.1109/JSEN.2023.3234143: Rapid Object Depth Estimation from Position-Referenced EMI Data Using Machine Learning

Marko Šimić, Davorin Ambruš, Vedran Bilas
University of Zagreb, Croatia

16:15

Invited Journal Author

10.1109/LSENS.2022.3233577: Automated Site Survey for Fingerprints in Fully-Blind Indoor Environments Based on Sensor Integration

Kyoung-Min Park{2}, Eunji Lee{3}, Jeongsik Choi{1}, Soram Kim{3}, Seong-Cheol Kim{3}
{1}Kyungpook National University, Korea; {2}Samsung Research, Samsung Electronics, Korea; {3}Seoul National University, Korea

16:30

Sensors Letters Paper

2121: Pulse Heating and Machine Learning for Enhanced Gas Identification and Concentration Detection with MOS Gas Sensors

Yi Zhuang, Xiaojiang Liu, Xue Wang, Gaoqiang Niu, Ran Cheng, Fei Wang
Southern University of Science and Technology, China

16:45

Sensors Letters Paper

2144: Traffic Intensity Detection Using General-Purpose Sensing

Aung Kaung Myat, Roberto Minerva, Attaphongse Taparugssanagorn, Rajapaksha Praboda, Noel Crespi
Telecom SudParis, Institut Polytechnique de Paris, Thailand; Telecom SudParis, Institut Polytechnique de Paris, France

17:00

Sensors Letters Paper

2140: 3D Printed Graphene-Based Piezoresistive Foam Mat for Pressure Detection Through Electrical Resistance Tomography and Machine Learning Classification Techniques

Nicola Pesce, Marco Fortunato, Alessio Tamburrano
Sapienza Università di Roma, Italy

17:15

Sensors Letters Paper

1994: A Sensor Model to Simulate the Excitation and Propagation of Lamb Waves in Lithium-Ion Pouch Cells

Alexander Siegl, Bernhard Schweighofer, Hannes Wegleiter
Technische Universität Graz, Austria

15:30 - 17:30
A3L-03: Advanced Sensing Systems
Room: Park Suite 3
Session Chair(s): Anselmo Frizera Neto, *Federal University of Espirito Santo*

15:30
Invited Journal Author
10.1109/JSEN.2022.3229227: Multimodal Barometric and Inertial Measurement Unit-Based Tactile Sensor for Robot Control
Gorkem Anil Al, Uriel Martinez-Hernandez
University of Bath, United Kingdom

15:45
Invited Journal Author
10.1109/LSENS.2023.3260733: Compact and Highly Efficient Midinfrared Fundamental-Mode Converter
Arpita Mishra{1}, Krishnakant Rana{2}, Talabattula Srinivas{1}
{1}Indian Institute of Science, India; {2}National Institute of Technology Warangal, India

16:00
Invited Journal Author
10.1109/JSEN.2023.3252340: Ultrasound Tomography for Lung Imaging: an Experimental Phantom Study
Manuchehr Soleimani
University of Bath, United Kingdom

16:15
Invited Journal Author
10.1109/JSEN.2023.3244831: A Highly Interpretable Framework for Generic Low-Cost UAV Attack Detection
Shihao Wu, Yang Li, Zhaoxuan Wang, Zheng Tan, Quan Pan
Northwestern Polytechnical University, China

16:30
Invited Journal Author
10.1109/JSEN.2022.3231434: High-Resolution Sensors for Mass Deposition and Low-Frequency Vibration Based on Phase-Shifted Bragg Gratings
Leandro Macedo{1}, Eduarda Preduzzi{1}, Letícia Avellar{1}, Carlos Eduardo Castellani{1}, Marcelo Eduardo Vieira Segatto{1}, Anselmo Frizera-Neto{1}, Carlos Marques{2}, Arnaldo Leal-Junior{1}
{1}Federal University of Espirito Santo, Brazil; {2}University of Aveiro, Portugal

16:45
Sensors Letters Paper
2138: A Comparative Study on Hall Plate Topologies in p-GaN Technology
Marco Crescentini{1}, Marco Marchesi{2}, Gian Piero Gibiino{1}, Lucian Petrisor Ion{3}, Maria Eloisa Castagna{2}, Ferdinando Iucolano{2}
{1}Alma Mater Studiorum – Università di Bologna, Italy; {2}STMicroelectronics, Italy; {3}University of Bologna, Italy

17:00

Sensors Letters Paper

2058: Soft 3-Axis Capacitive Force Sensor for Robotic E-Skin on Curved Surfaces

Kieran Morton{2}, Ryusuke Ishizaki{1}, Ziqiang Chen{2}, Mirza S. Sarwar{2}, John D.W. Madden{2}
{1}Honda R&D Co., Ltd, Frontier Robotics Honda R&D, Japan; {2}University of British Columbia, Canada

17:15

Sensors Letters Paper

2106: Laser-Induced Graphene on Chitosan: an Enabling Technology for Sustainable Resistive Humidity Sensors

Johanna Zikulnig{2}, Lukas Neumaier{2}, Martin Lenzhofer{2}, Sandro Carrara{1}, Jürgen Kosel{2}
{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}Silicon Austria Labs GmbH, Austria

15:30 - 17:30
A3L-04: Biosensors
Room: Park Suite 4
Session Chair(s): Hyejin Moon, *The University of Texas at Arlington*
Uwe Schnakenberg, *RWTH Aachen University*

15:30

INVITED

1079: Sensors for General Health Diagnostics Using Biomarkers in Bodily Fluids

Andrew Steckl
University of Cincinnati, United States

16:00

1183: Biosensor Based on Electrical Impedance Tomography for 3D Cancer Cell Culture Imaging

Julien Claudel{2}, Sabine Mazerbourg{1}, Victorine Lacroix{1}, Rémi Bettenfeld{2}, Cyril Schlauder{2}, Djilali Kourtiche{2}, Stéphane Flament{1}
{1}Centre de Recherche en Automatique de Nancy, CRNS, Université de Lorraine, France; {2}Institut Jean Lamour, CNRS, Université de Lorraine, France

16:15

1730: Pt Dendrimer-Encapsulated Nanoparticles Modified UMEAs for Electrochemiluminescence Heterogeneous Immunoassay

Yun Hui{1}, Weiliang Shu{1}, Jiaxin Zhu{2}, Jiamei Li{1}, Tianzhun Wu{1}, Wenhua Zhou{1}, Xuefeng Yu{1}
{1}Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, China; {2}University of Pennsylvania, United States

16:30

1890: A Highly Sensitive Immunosensor for White Spot Syndrome Virus (WSSV) Envelope Protein VP28 Detection Based on Electrochemical Impedance Spectroscopy Technique

Linh Huynh Thi Thuy{1}, Phu Nguyen Dang{5}, Hung Cao{4}, Hung Anh Nguyen{4}, Jung-Chih Chiao{3}, Chun-Ping Jen{2}, Loc Do Quang{6}, Trinh Chu Duc{5}, Tung Thanh Bui{5}
{1}Hue University, Vietnam; {2}National Chung Cheng University, Taiwan; {3}Southern Methodist University, United States; {4}University of California, Irvine, United States; {5}University of Engineering and Technology, Vietnam National University, Vietnam; {6}Vietnam National University-Hanoi University of Science, Vietnam

16:45
1022: Independently Operational Dual-Frequency Band Metamaterial Based EM Biosensor for Identification and Quantification of Impurities in Vegetable Oils
Debarati Dutta, Ravi Anand, Anirban Sarkar
Indian Institute of Technology Mandi, India

17:00
1092: A Highly Sensitive O2•− Biosensor Based on PEDOT:PSS/SA Composite Conductive Hydrogel
Yuyang Yuan{2}, Tianyu Li{2}, Shiyi Xu{2}, Zhichao Ye{2}, Shanshan Zhang{2}, Lu Fang{1}, Bo Liang{2}
{1}Hangzhou Dianzi University, China; {2}Zhejiang University, China

17:15
1392: Antifouling Iridium Oxide as a Reference Electrode for Electrochemical Sensing on Cochlear Implants
Jolan Wellens, Olivier Deschaume, Tristan Putzeys, Nicolas Verhaert, Carmen Bartic
Katholieke Universiteit Leuven, Belgium

15:30 - 17:30
A3L-05: Emerging Sensors for Remote, Environmental, and Deformation Sensing
Room: Park Suite 5
Session Chair(s): Mark Cheng, *The University of Alabama*

15:30
INVITED
1918: Parity-Time (PT-Symmetric Telemetry for Wireless Micro- and Nano-Sensors
Pai-Yen Chen
University of Illinois Chicago, United States

16:00
1177: Assessing Torsional Deflection of Alpine Skis - A Proof of Concept Utilizing Printed Electronics in a Laboratory Setting
Christoph Thorwartl{3}, Andreas Tschepp{2}, Helmut Holzer{1}, Thomas Stöggl{3}
{1}Atomic Austria GmbH, Austria; {2}Joanneum Research Forschungsgesellschaft mbH, Austria; {3}University of Salzburg, Austria

16:15
1784: Wireless Battery-Free Sub-mW Underground Soil Moisture Sensing System
Sheng Ding{1}, Shad Roundy{1}, Ramesh Goel{1}, Cody Zesiger{2}, Darrin J Young{1}
{1}University of Utah, United States; {2}Utah State University, United States

16:30
1275: Stretchable Shape-Sensing Ribbons
Stephanie Woodman, Anjali Agrawala, Rebecca Kramer-Bottiglio
Yale University, United States

16:45
1506: Exploring the Potential of Magnetically Active Polymers in Force Sensing: Material, Design, and Experimental Insights
Yassine Ahaggach, Yassine Lamkharbech, Samira Jafari, Matthias Soddemann
Dtwyler Holding Inc., Switzerland

17:00
1546: Log-Spiral Nanoantenna-Based Long-Wave Infrared Detectors
Gergo Szakmany{2}, Collin Finnan{2}, Edward Kinzel{2}, Alexei Orlov{2}, Wolfgang Porod{2}, Jeffrey Yang{2}, Stephen White{1}, Gary Bernstein{2}
{1}Air Force Research Laboratory, United States; {2}University of Notre Dame, United States

17:15
1649: Gate Oxide Induced Reliability Assessment of Junctionless FinFET-Based Hydrogen Gas Sensor
Navneet Gandhi{1}, Rajeewa Kumar Jaisawal{1}, Sunil Rathore{1}, P N Kondekar{1}, Ankit Dixit{3}, Naveen Kumar{3}, Vihar Georgiev{3}, Navjeet Bagga{2}
{1}Indian Institute of Information Technology, Design and Manufacturing, Jabalpur, India; {2}Indian Institute of Technology Bhubaneswar, India; {3}University of Glasgow, United Kingdom

15:30 - 17:30
A3L-06: Sensor Networks and IOT
Room: Park Suite 6
Session Chair(s): Domenico Balsamo, *Newcastle University*
Yacine GHAMRI-DOUDANE, *La Rochelle University*

15:30
INVITED
2027: Ultra-Wideband Technology: Unlocking the Potential of Low Power IoT with Precise Localization and Energy-Efficient Wake-Up Radio
Michele Magno
ETH Zürich, Switzerland

16:00
1591: Enhancing Lightweight Neural Networks for Small Object Detection in IoT Applications
Liam Boyle{1}, Nicolas Baumann{1}, Seonyeong Heo{2}, Michele Magno{1}
{1}ETH Zürich, Switzerland; {2}Kyung Hee University, Korea

16:15
1797: Area and Power Efficient Receiver for Narrowband Internet of Things Applications
Nishant Patil{1}, Sankaran Aniruddhan{2}
{1}Columbia University in the City of New York, United States; {2}Indian Institute of Technology Madras, India

16:30
1806: A Compressed Sensing-Based Resolution Reconfigurable Multi-Channel Sensor Node
Laxmeesha Somappa{1}, Shahid Malik{2}, Shuchin Aeron{3}, Sameer Sonkusale{3}, Maryam Shojaei Baghini{1}
{1}Indian Institute of Technology Bombay, India; {2}Indian Institute of Technology Delhi, India; {3}Tufts University, United States

16:45
1888: An Orchestrator Framework for IoT-Based Disaster Prevention Simulation
Kei Hiroi{2}, Akihito Kohiga{1}, Sho Fukaya{3}, Yoichi Shinoda{1}
{1}Japan Advanced Institute of Science and Technology, Japan; {2}Kyoto University, Japan; {3}Suwa University of Science, Japan

17:00
1050: Intra-Epochal Dynamics of Periodically-Repairable Barrier-Covering Wireless Sensor Networks
Alexander Michael Daniel
Defence Research and Development Canada, Canada

17:15
1169: A Novel Approach to Air Quality Monitoring: Towards Miniature, Self-Organized, and Low-Power Device
Tao Wang{1}, Yu Wu{2}, Wangze Ni{1}, Jianhua Yang{1}, Yimin Wang{1}, Jiaqing Zhu{3}, Min Zeng{1}, Nantao Hu{1}, Zhi Yang{1}
{1}Shanghai Jiao Tong University, China; {2}Shanghai Marine Diesel Engine Research Institute, China; {3}Shanghai University of Engineering Science, China

15:30 - 17:30
A3L-07: Optical Sensors - 1
Room: Park Suite 7
Session Chair(s): Jan Nissinen, *University of Oulu*

15:30
1246: High Precision Measurement of Electric Field at the Nanoscale in Optomechanical Systems
Cuihong Li{1}, Shaochong Zhu{1}, Jinchuan Wang{1}, Zhiming Chen{1}, Chaoxiong He{1}, Huizhu Hu{2}
{1}Zhejiang Lab, China; {2}Zhejiang Lab, Zhejiang University, China

15:45
1319: Magnetic Field Compensation for an Optically Pumped Magnetometer Without Iteration
Yaqiong Niu, Chaofeng Ye
ShanghaiTech University, China

16:00
1107: Model Updating and Force Identification from Phase-Based Motion Measurements
Wendi Zhang, Jiwen Zhou, Xiaojian Wang, Jinhong Wang, Hongguang Li, Guang Meng
Shanghai Jiao Tong University, China

16:15
INVITED
1926: Hyperspectral Imaging in the Molecular Fingerprint Band and its Application in Heritage Science
Derryck Reid{1}, Jake Charsley{1}, Marius Rutkauskas{1}, Yoann Altmann{1}, Michela Botticelli{2}, Valentina Risdonne{2}, Margaret Smith{2}, Tess Visser{2}, Christina Young{2}
{1}Heriot-Watt University, United Kingdom; {2}University of Glasgow, United Kingdom

16:45
1306: Automatic Camera-Based Advanced Slump Flow Testing for Improved Reliability
Axel Dürrbaum, Farzad Rezazadeh, Andreas Kroll
Universität Kassel, Germany

17:00
1882: Smart Telescope System with Automatic Tracking
Kohei Shimasaki, Masaru Ito, Shaopeng Hu, Feiyue Wang, Idaku Ishii
Hiroshima University, Japan

17:15
1757: A Gas Imaging Sensor System of Automotive Exhaust Plumes for Remote Emission Sensing Application Basing on Schlieren Imaging - an Approach to Visualize and Size Vehicle Exhaust Plumes
Hafiz Hashim Imtiaz, Paul Schaffer, Martin Kupper, Alexander Bergmann
Technische Universität Graz, Austria

15:30 - 17:30
A3L-08: Sensor Data Processing & AI: Human Activity and Biomedical Applications
Room: Park Suite 8
Session Chair(s): Ashish Pandharipande, *NXP Semiconductors*

15:30
1690: Radar-Based Continuous Human Activity Recognition with Multi-Label Classification
Ingrid Ullmann{2}, Ronny Gerhard Guendel{1}, Nicolas Christian Kruse{1}, Francesco Fioranelli{1}, Alexander Yarovoy{1}
{1}Delft University of Technology, Netherlands; {2}Friedrich-Alexander-Universitt Erlangen-Nrnberg, Germany

15:45
1830: TinyTracker: Ultra-Fast and Ultra-Low-Power Edge Vision In-Sensor for Gaze Estimation
Pietro Bonazzi, Thomas Rgg, Sizhen Bian, Yawei Li, Michele Magno
ETH Zrich, Switzerland

16:00
1507: Triboelectric Nanogenerators for Gait Analysis: Design, Development, and Validation
Omar Raita{1}, Yassine Ahaggach{1}, Simon Kervyn{1}, Leszek Jakuczek{1}, Samira Jafari{1}, Anisoara Ionescu{2}
{1}Dtwyler Holding Inc., Belgium; {1}Dtwyler Holding Inc., Switzerland; {2}Dtwyler Holding Inc., cole Polytechnique Fédérale de Lausanne, Switzerland

16:15
1249: Bayesian Filter-Based Ultrasonic Continuous Hand Gesture Recognition for Low-Resource Platform
Pixi Kang, Lingfeng Gao, Xiangyu Li
Tsinghua University, China

16:30
1567: An Efficient Deep-Learning-Based Solution for the Recognition of Relative Changes in Mental Workload Using Wearable Sensors
Majd Saleh{2}, Stéphane Paquelet{2}, Pierre Castel{2}, Marc Hoarau{2}, Nico Pallamin{2}, Daniel Lewkowicz{1}
{1}Human Design Group, France; {2}Institute of Research and Technology b-com, France

16:45
1598: Machine Learning Methods for Electroencephalogram-Based Age Prediction
Grant Sinha{5}, Nabil Belacel{3}, Zhiyang Gu{2}, Sam Doesburg{4}, George Medvedev{1}, Urs Ribary{4}, Vasily Vakorin{4}, Pengcheng Xi{3}
{1}Fraser Health Authority, Canada; {2}McMaster University, Canada; {3}National Research Council Canada, Canada; {4}Simon Fraser University, Canada; {5}University of Waterloo, Canada

17:00
1734: Enhancing Sensor-Based Human Activity Recognition Using Efficient Channel Attention
Anuchit Jitpattanakul{1}, Sakorn Mekruksavanich{2}
{1}King Mongkut's University of Technology North Bangkok, Thailand; {2}University of Phayao, Thailand

17:15
1312: Data-Driven Shape Sensing of Continuum Dexterous Manipulators Using Embedded Capacitive Sensor
Qihang Li, Wenpeng Wang, Shuya Liu, Amit Jain, Mehran Armand
Johns Hopkins University, United States

15:30 - 17:30
A3L-09: Force and Pressure Sensors
Room: Park Suite 9
Session Chair(s): Samuel Huber, *Eastern Switzerland University of Applied Sciences*
Massood Tabib-Azar, *University of Utah*

15:30
1875: A 36% Scandium Aluminum Nitride pMUT - FBAR Dual Mode Pressure Sensor for IoT Applications
Walter Gubinelli{1}, Luca Colombo{1}, Bernard Herrera Soukup{2}, Pietro Simeoni{1}, Blair Kopp{1}, Alberto Corigliano{3}, Cristian Cassella{1}, Matteo Rinaldi{1}
{1}Northeastern University, United States; {2}Northeastern University, Qualcomm Incorporated, United States; {3}Politecnico di Milano, Italy

15:45
1513: A Novel High-Pressure Resonant Microsensor Based on Volume Compressed Sensing
Zongze Yu{1}, Pan Qian{1}, Yulan Lu{2}, Deyong Chen{3}, Junbo Wang{3}, Bo Xie{2}, Nan Li{2}, Xiaoye Huo{2}
{1}Aerospace Information Research Institute, China; {2}Aerospace Information Research Institute, Chinese Academy of Sciences, China; {3}AIR, University of Chinese Academy of Sciences, Chinese Academy of Sciences, China

16:00
1358: A Wide Temperature Range Weakly Coupled Resonant Micro-Pressure Sensor
Jiaxin Qin{3}, Deyong Chen{2}, Bo Xie{1}, Junbo Wang{2}, Yulan Lu{1}, Bowen Wang{3}, Zhaoyang Zhai{3}, Jian Chen{2}, Nan Li{1}, Xiaoye Huo{1}
{1}Aerospace Information Research Institute, Chinese Academy of Sciences, China; {2}AIR, University of Chinese Academy of Sciences, Chinese Academy of Sciences, China; {3}University of Chinese Academy of Sciences, Chinese Academy of Sciences, China

16:15
1297: Design and Characterization of Resonant Pressure Microsensor Based on Parametric Pump
Wenliang Xia{1}, Bo Xie{1}, Yulan Lu{1}, Junbo Wang{2}, Deyong Chen{2}, Jian Chen{2}, Nan Li{1}, Xiaoye Huo{1}
{1}Aerospace Information Research Institute, Chinese Academy of Sciences, China; {2}AIR, University of Chinese Academy of Sciences, Chinese Academy of Sciences, China

16:30
1345: 6-Axis Force-Torque Sensor Utilizing Four Pairs of Standing Laser-Induced Graphene Cantilevers
Rihachiro Nakashima, Hidetoshi Takahashi
Keio University, Japan

16:45
1349: A Quantitative Identification of "Moist Feeling" by High-Resolution Tactile Sensor Devices
Yuto Morita, Genki Yamada, Kyohei Terao, Fusao Shimokawa, Hidekuni Takao
Kagawa University, Japan

17:00
1429: Robust Multi-Layer Kevlar Aerogel for High Performance Force Sensor
Jiaxin Liu, Ziyang Ke, Tielin Shi, Hu Long
Huazhong University of Science and Technology, China

17:15
1865: A Novel Sensor for Real-Time Pressure Monitoring in Colonoscopy Training
Anirudh Vajpeyi{2}, Anish Naidu{1}, Jeffrey Hawel{2}, Christopher Schlachta{2}, Rajni Patel{2}
{1}CSTAR, Canada; {2}Western University, CSTAR, Canada

7:30 - 8:30
Registration
Room: Grand Park Lobby

8:30 - 15:30
Workshop: Electronic Skin Patches: Convergent Technologies for Vital Signs Monitoring
Room: Park Suite 9

8:30 - 9:30
B1L-01: Condition Monitoring
Room: Park Suite 1
Session Chair(s): Yixin Wang, *Hong Kong University of Science and Technology*
Jules Moualeu, *University of the Witwatersrand*

8:30
Sensors Letters Paper
1967: Vibration Monitoring in the Compressed Domain with Energy-Efficient Sensor Networks
Edoardo Ragusa{2}, Federica Zonzini{1}, Luca De Marchi{1}, Paolo Gastaldo{2}
{1}Alma Mater Studiorum – Università di Bologna, Italy; {2}Università degli studi di Genova, Italy

8:45
Sensors Letters Paper
2054: Speeding Up System Identification Algorithms on a Parallel RISC-V MCU for Fast Near-Sensor Vibration Diagnostic
Amirhossein Moallemi, Riccardo Gaspari, Federica Zonzini, Luca De Marchi, Davide Brunelli, Luca Benini
Alma Mater Studiorum – Università di Bologna, Italy

9:00
Sensors Letters Paper
2079: Acoustic-Based Detection Technique for Identifying Worn-Out Components in Large-Scale Industrial Machinery
Christof Pichler{1}, Markus Neumayer{1}, Bernhard Schweighofer{1}, Christoph Feilmayr{2}, Stefan Schuster{2}, Hannes Wegleiter{1}
{1}Technische Universität Graz, Austria; {2}voestalpine Stahl GmbH, Austria

9:15
Sensors Letters Paper
2128: Wireless Strain and Temperature Monitoring in Reinforced Concrete Using Surface Acoustic Wave (SAW) Sensors
Pierre Jeltiri{2}, Firas Al-Mahmoud{2}, Rémi Boissière{2}, Baptiste Paulmier{2}, Tony Makdissy{2}, Elmazria Omar{2}, Nicolay Pascal{1}, Hage-Ali Sami{2}
{1}Carinthia Institute for Smart Materials CiSMAT, Carinthia University of Applied Sciences, Austria; {2}Institut Jean Lamour, CNRS, Université de Lorraine, France

8:30 - 9:30
B1L-02: Systems: Machine Learning and Motion Control
Room: Park Suite 2
Session Chair(s): Valentina Zega, *Politecnico di Milano*
Alberto Sinibaldi, *Sapienza Università di Roma*

8:30
Sensors Letters Paper
1931: Obstacle Avoidance Behavior Combining Dodging Control and Movable Soft Material
Mitsuharu Matsumoto, Shogo Hanawa
University of Electro-Communications, Japan

8:45
Sensors Letters Paper
2082: Plug-and-Play Sparse Inertial Motion Tracking with Sim-to-Real Transfer
Simon Bachhuber{1}, Dustin Lehmann{3}, Eva Dorschky{1}, Anne D. Koelewijn{1}, Thomas Seel{2}, Ive Weygers{1}
{1}Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; {2}Leibniz Universität Hannover, Germany; {3}Technische Universität Berlin, Germany

9:00
Sensors Letters Paper
2112: TinyRCE: Multipurpose Forward Learning for Resource Restricted Devices
Danilo Pau{1}, Andrea Pisani{1}, Fabrizio Aymone{1}, Gianluigi Ferrari{2}
{1}STMicroelectronics, Italy; {2}Universita degli Studi di Parma, Italy

9:15
Sensors Letters Paper
2094: Landmine Identification from Pulse Induction Metal Detector Data Using Machine Learning
Marko Šimi?, Davorin Ambruš, Vedran Bilas
University of Zagreb, Croatia

8:30 - 9:30
B1L-03: Advanced Localization and Tracking Techniques
Room: Park Suite 3
Session Chair(s): Yun-Ju Lee, *National Tsing Hua University*
Mehmet Yuce, *Monash University*

8:30
Invited Journal Author
10.1109/JSEN.2022.3232479: UWB Sensor-Based Indoor LOS/NLOS Localization with Support Vector Machine Learning
Hongchao Yang{2}, Yunjia Wang{2}, Chee Kiat Seow{3}, Meng Sun{2}, Minghao Si{2}, Lu Huang{1}
{1}54th Research Institute of China Electronics Technology Group Corporation, China; {2}Key Laboratory of Land Environment and Disaster Monitoring, China University of Ming and Technology, China; {3}University of Glasgow, United Kingdom

8:45

Invited Journal Author

10.1109/JSEN.2023.3235869: One Step of Gait Information from Sensing Walking Surface for Personal Identification

Yun-Ju Lee, Chao-Che Wu
National Tsing Hua University, Taiwan

9:00

Sensors Letters Paper

1969: Demodulation Methods for a Wireless Electromagnetic Tracker

François Guerret{4}, Pauline Vehrlé{3}, Hendrik Meier{3}, Antoine Girard{2}, Christophe Prieur{1}
{1}GIPSA-lab, France; {2}L2S, CentraleSupélec, France; {3}Sysnav, France; {4}Sysnav, Laboratoire des signaux et systèmes, CentraleSupélec, France

9:15

Sensors Letters Paper

2064: OpenGimbal: a 3 Degrees of Freedom Open Source Sensing and Testing Platform for Nano and Micro UAVs

Suryansh Sharma, Tristan Dijkstra, Ranga Rao Venkatesha Prasad
Delft University of Technology, Netherlands

8:30 - 9:30
B1L-04: Wearable, Flexible and Textile Sensing
Room: Park Suite 4
Session Chair(s): Hyejin Moon, *The University of Texas at Arlington*
Tao Li, *University of Cincinnati*

8:30

Invited Journal Author

10.1109/JSEN.2022.3169504: Optically Unobtrusive Zeolite-Based Dry Electrodes for Wearable ECG Monitoring

Salvatore Andrea Pullano{1}, Deepa Kota{2}, Karthik Kakaraparty{3}, Antonino S. Fiorillo{1}, Ifana Mahbub{3}
{1}Università degli studi Magna Græcia di Catanzaro, Italy; {2}University of North Texas, United States; {3}University of Texas Dallas, United States

8:45

Invited Journal Author

10.1109/LSENS.2023.3274682: Flexible Sensor and Readout Circuitry for Continuous Ion Sensing in Sweat

Mattia Petrelli{2}, Ata Golparvar{3}, Ali Meimandi{1}, Bajramshahe Shkodra{2}, Martina Aurora Costa Angeli{2}, Aniello Falco{2}, Paolo Lugli{2}, Luisa Petti{2}, Sandro Carrara{1}
{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}Free University of Bozen-Bolzano, Italy; {3}Sabanci University, École Polytechnique Fédérale de Lausanne, Switzerland

9:00

Invited Journal Author

10.1109/LSENS.2023.3239991: Smart Glove with Fully Integrated Textile Sensors and Wireless Sensor Frontend for the Tactile Internet

Jens Wagner, Hans Winger, Chokri Cherif, Frank Ellinger
Technische Universität Dresden, Germany

8:30 - 9:30
B1L-05: Sensor Materials, Fabrication and Packaging - 2
Room: Park Suite 5
Session Chair(s): Ulrich Schmid, *TU Wien*
Arum Han, *Texas A&M University*

8:30

1366: Low-Bow Glass-Si Anodic Wafer Bonding at High Temperature by Means of CTE Engineering of Corning Novel Fusion Glass

Ashkan Rad
SUSS MicroTec Solutions GmbH & Co. KG, Germany

8:45

1035: Achieving Submicron Sphericity in Bowl-Shaped Micro Hemispherical Resonators Through Precision Molding Process

Yinan Zhang, Ruixue Zhang, Haoyu Gu, Bin Zhou, Qi Wei, Rong Zhang
Tsinghua University, China

9:00

1002: From Conventional Non-Conductive Foams to Soft Piezoresistive Pressure Sensors: A Low-Cost Approach to Large-Area Pressure-Mapping

Manuel Reis Carneiro{1}, Luis Rosa{2}, Mahmoud Tavakoli{2}
{1}Carnegie Mellon University & University of Coimbra, Portugal; {2}University of Coimbra, Portugal

9:30

1399: MEMS Pressure Sensor Based on Piezoresistive Effect of MoS2 Film

Xing Pang, Qi Zhang, Xiaoya Liang, Yulong Zhao
Xi'an Jiaotong University, China

8:30 - 9:30
B1L-06: Optical Sensors: Materials and Applications
Room: Park Suite 6
Session Chair(s): Semir El-Ahmar, *Poznan University of Technology*
Zhenyun Qian, *Northeastern University*

8:30

Sensors Letters Paper

2004: Optical Limiting Sensor Based on Multilayer Optimization of Ag/VO2 Phase Changing Material

Camilla Baratto{2}, Marco Gandolfi{4}, Andrea Tognazzi{3}, Paolo Franceschini{4}, Bohan Li{1}, Rocio Camacho Morales{1}, Domenico De Ceglia{4}, Alfonso Carmelo Cino{3}, Dragomir Neshev{1}, Costantino De Angelis{4}
{1}Australian National University, Australia; {2}CNR-INO, PRISM Lab, Italy; {3}Università degli Studi di Palermo, Italy; {4}University of Brescia, Italy

8:45

Sensors Letters Paper

2116: Band Gap Engineering of Pb1-xCdxSe Thin Films Providing mid-IR Photoluminescent Based Light Emitting Diodes for Use in Non-Dispersive Infrared Gas Sensors

Greg McGann{3}, Carlos Garcia Nuez{2}, Lewis Fleming{3}, David Hutson{3}, Ewan Waddell{1}, Des Gibson{3}
{1}Alba Sense Ltd, United Kingdom; {2}University of Glasgow, United Kingdom; {3}University of the West of Scotland, United Kingdom

9:00

Sensors Letters Paper

2072: Field Verification of Distributed Acoustic Fibre Optic Sensor System Using Customised Disturbance Simulator Equipment

Saharudin Suhairi{1}, Mohamad Rihan Ain Nabihah{1}, Hisham Mohd Hafizulfika{1}, Mohamed Khairom Nizam{1}, Mohd Khusni Muhammad Nur Salihin{1}, Al Bakri Anas Firdaus{2}, Amiruddin Meor Tawfik{2}
{1}MIMOS Berhad, Malaysia; {2}Ventura IOT Sdn Bhd, Malaysia

9:15

Sensors Letters Paper

2135: Slow-Light Enhanced CO2 Sensing Using 3D Photonic Crystals Fabricated Using Two-Photon Polymerization

Anuj Singhal, Anandvinod Dalmiya, Patrick Lynch, Igor Paprotny
University of Illinois Chicago, United States

8:30 - 9:30

B1L-07: Chemical, Electrochemical and Gas Sensors - 3

Room: Park Suite 7

Session Chair(s): Xiaoshan Zhu, *Universityof Nevada Reno*
Hamida Hallil Abbas, *Bordeaux University*

8:30

1365: Super-Nernstian ISFET Using Scaled Coplanar Multi-Gated Channels

Sooraj Sanjay, Navakanta Bhat
Indian Institute of Science, India

8:45

1262: Performance of a Multiparametric Water Quality Sensor in a Small-Scale Water Distribution Network

Balakumara Vignesh Muppidathi{2}, Stéphane Laporte{3}, Yan Ulanowski{3}, Senthilmurugan Subbiah{1}, Bérengère Lebental{3}
{1}Indian Institute of Technology Guwahati, India; {2}Indian Institute of Technology Guwahati, Université Gustave Eiffel, India; {3}Université Gustave Eiffel, France

9:00

1242: Rapid Detection of Bacterial Infection Using Gas Phase Time Series Analysis

Christoforos Panteli{2}, Marios Stylianou{1}, Andreas Anastasiou{2}, Chrysafis Andreou{2}
{1}S.N. CYLABS LTD, Cyprus; {2}University of Cyprus, Cyprus

9:15
1239: Ionic Liquid-Gated Graphene FET Sensors for Detecting Nitrate Nitrogen (NO3-N) in Agricultural Soil
Naoki Shiraishi{1}, Jian Lu{2}, Ryo Imaizumi{3}, Lan Zhang{2}, Ryutaro Maeda{2}, Mutsumi Kimura{3}
{1}National Agriculture and Food Research Organization, Japan; {2}National Institute of Advanced Industrial Science and Technology, Japan; {3}Shinshu University, Japan

8:30 - 9:30
B1L-08: Sensor Phenomenology, Modeling and Evaluation - 1
Room: Park Suite 8
Session Chair(s): Tao Li, *University of Cincinnati*

8:30
INVITED
1919: Ultra-Low-Power Wireless Gas Sensor Network for Off-Grid Operation in Agriculture
Hanseup Kim{3}, Shakir-Ul Khan{3}, Aishwaryadev Banerjee{3}, Mohit U. Karkhanis{3}, Sayali Tope{3}, Farhan Sium{3}, Brian Hatasaka{3}, Ashrafuzzaman Bulbul{3}, Kyung-Heon Kim{1}, Rana Dalapati{3}, Seungbeom Noh{3}, Ravi Mural{2}, Mingyue Ji{3}, Ling Zang{3}, James Schnable{2}, Carlos H. Mastrangelo{3}
{1}Gyeongsang National University, Korea; {2}University of Nebraska, United States; {3}University of Utah, United States

9:00
1812: Improving Tidal Volume Estimation via Fusion of Impedance Pneumography and Accelerometry
John Berkebile, Jesus Antonio Sanchez-Perez, Goktug Ozmen, Omer Inan
Georgia Institute of Technology, United States

9:15
1281: Development and Validation of a Numerical Model for Miniature Electrochemical Oxygen Sensors
Shan Zhang{2}, Ilka Schmüser{2}, Jamie Marland{1}, Ian Underwood{1}
{1}Institute for Integrated Micro and Nano Systems, United Kingdom; {2}University of Edinburgh, United Kingdom

9:30 - 10:30
B2L-01: Pressure and Magnetic Sensors
Room: Park Suite 1
Session Chair(s): Edoardo Ragusa, *Università degli studi di Genova*
Mitradip Bhattacharjee, *Indian Institute of Science Education and Research, Bhopal*

9:30
Sensors Letters Paper
1941: Tunable Piezoresistive NEMS Pressure Sensor Simulation Under Various Environmental Conditions
Nitish Kumar{1}, Ankur Gupta{1}, Pushpapraj Singh{1}, Subhas Chandra Mukhopadhyay{2}
{1}Indian Institute of Technology Delhi, India; {2}Macquarie University, Australia

9:45

Sensors Letters Paper

2047: A Flexible Microstructured Pressure Sensor with High Performance Based on Vertically Aligned Carbon Nanotubes and Ion-Gel

Yixin Wang, Xingru Chen, Rui Jiao, Hongyu Yu
Hong Kong University of Science and Technology, China; Hong Kong University of Science and Technology, Hong Kong

10:00

Sensors Letters Paper

1972: High-Temperature Stability of Sensor Platforms Designed to Detect Magnetic Fields in a Harmful Radiation Environment

Wiktoria Reddig{2}, Marta Przychodnia{2}, Tymoteusz Ciuk{1}, Semir El-Ahmar{2}
{1}Institute of Microelectronics and Photonics, Lukasiewicz Research Network, Poland; {2}Poznan University of Technology, Poland

10:15

Sensors Letters Paper

1933: Magnetic Field Sensor Operating from Cryogenics to Elevated Temperatures

Semir El-Ahmar, Jakub Jankowski, Pawe? Czaja, Wiktoria Reddig, Marta Przychodnia, Jan Raczy?ski, Wojciech Koczorowski
Poznan University of Technology, Poland

9:30 - 10:30
B2L-02: Networks and IoT
Room: Park Suite 2
Session Chair(s): Mitsuharu Matsumoto, *University of Electro-Communications*
Srinivas Tadigadapa, *Northeastern University*

9:30

Sensors Letters Paper

2110: On the Performance of Cache- and Energy Harvesting–Assisted Noma in D2D Communications with Hardware Impairments

Alok Kumar Shukla{1}, Jules Moualeu{3}, Prabhat Kumar Upadhyay{1}, Fambirai Takawira{3}, Pedro Nardelli{2}
{1}Indian Institute of Technology Indore, India; {2}Lappeenranta-Lahti University of Technology, Finland; {3}University of the Witwatersrand, South Africa

9:45

Sensors Letters Paper

2133: Light Residual Network for Human Activity Recognition Using Wearable Sensor Data

Francisco Calatrava Nicolás, Oscar Martinez Mozos
Örebro University, Sweden

10:00

Sensors Letters Paper

2030: An Integrated sensorized Platform for Environmental Monitoring in Healthcare

Simona Gandah{2}, Marcello Chiurazzi{2}, Irene Domina{2}, Neri Niccolò Dei{2}, Giorgia Spreafico{2}, Francesco Scotto Di Luzio{4}, Nevio Luigi Tagliamonte{4}, Sofia Sanz Granda{1}, Giuseppe Fico{3}, Leandro Pecchia{4}, Loredana Zollo{4}, Gastone Ciuti{2}
{1}Inetum, Spain; {2}Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna, Italy; {3}Universidad Politécnica de Madrid, Spain; {4}Università Campus Bio-Medico di Roma, Italy

10:15

Sensors Letters Paper

2114: Internet of Things-Based Smart-Home Time-Priority-Cost (TPC)-Aware Energy Management System for Energy Cost Reduction

Ismail Haitham{1}, Imad Jawhar{1}, Bilal Hammoud{2}
{1}Al Maaref University, Lebanon; {2}CNRS-L, Lebanon

9:30 - 10:30
B2L-03: Imaging
Room: Park Suite 3
Session Chair(s): Danilo Pau, *STMicroelectronics*
Pau Casacuberta, *Universitat Autònoma de Barcelona*

9:30

Sensors Letters Paper

2055: A Comparison Between Fourier and Hadamard Single-Pixel Imaging in Deep Learning-Enhanced Image Reconstruction

Xin Wang, Jia You Lim, Muhammad Razin Rosla, Jun Yi Lim, Vishnu Monn Baskaran, Yeong Shiong Chiew, Raphaël C.-W. Phan
Monash University Malaysia, Malaysia

9:45

Sensors Letters Paper

2101: Kalman Filter-Driven Blind Source Localization for Passive 3D ToF Imaging

Faisal Ahmed{2}, Miguel Heredia Conde{2}, Paula López Martínez{1}
{1}CiTIUS, Universidade de Santiago de Compostela, Spain, Spain; {2}ZESS, University of Siegen, Germany

10:00

Sensors Letters Paper

2142: Towards High-Resolution Face Image Generation from Coded Aperture Camera

Hatef Otroshi Shahreza{2}, Alexandre Veuthey{1}, Sébastien Marcel{3}
{1}ams-OSRAM, Switzerland; {2}École Polytechnique Fédérale de Lausanne, Switzerland; {3}Idiap Research Institute, Switzerland

10:15

Sensors Letters Paper

1987: Synchronization of a New Light-Flashing Shield with an External-Triggered Camera

Jose de Jesus Castillo Zamora{1}, Amaury Negre{2}, Jean-Marc Ingargiola{1}, Abdoullah Ndoye{2}, Florian Pouthier{4}, Jonathan Dumon{2}, Sylvain Durand{3}, Nicolas Marchand{2}, Franck Ruffier{1}
{1}Aix Marseille Université, CNRS, France; {2}GIPSA-Lab, CNRS, Université Grenoble Alpes, France; {3}Strasbourg University, CNRS, INSA Strasbourg, ICube, France; {4}Strasbourg University, CNRS, INSA Strasbourg, ICube / Université Grenoble Alpes, CNRS, GIPSA-lab, France

9:30 - 10:30
B2L-04: Advanced Image Sensing Techniques
Room: Park Suite 4
Session Chair(s): Siavash Pourkamali, *University of Texas at Dallas*

9:30

Invited Journal Author

10.1109/LSENS.2022.3209074: Demonstrating the Feasibility of Subepidermal Image Sensing for Hand Posture and Gesture Recognition

Dimas Antony Chacon Salas, Kazuhiro Shinoda, Tomoyuki Yokota, Koji Yatani
University of Tokyo, Japan

9:45

Invited Journal Author

10.1109/LSENS.2022.3216894: Low-Complexity Lossless Coding for Memory-Efficient Representation of Event Camera Frames

Ionut Schiopu, Radu Ciprian Bilcu
Huawei Technologies Oy Finland Co. Ltd, Finland

10:00

Invited Journal Author

10.1109/JSEN.2023.3258899: Robotic Positioning for Quality Assurance of Feature-Sparse Components Using a Depth-Sensing Camera

Adam Gilmour{2}, William Jackson{2}, Dayi Zhang{2}, Gordon Dobie{2}, Charles Macleod{2}, Benjamin Karkera{1}, Thomas Barber{1}
{1}BAE Systems, United Kingdom; {2}University of Strathclyde, United Kingdom

10:15

Invited Journal Author

10.1109/JSEN.2023.3242007: A Rough Set Framework for Multihuman Tracking in Surveillance Video

Thangaswamy Judi Vennila, Vanniappan Balamurugan
{1}Manonmaniam Sundaranar University, India

9:30 - 10:30
B2L-05: Terahertz and Optical Sensors
Room: Park Suite 5
Session Chair(s): Fabrice Labeau, *McGill University*
Chang-hee Won, *Temple University*

9:30
Invited Journal Author
10.1109/ICEAA.2017.8065473: Plasmonic Nanoantennas for Advanced Terahertz Optoelectronics
Mona Jarrahi
University of California, Los Angeles, United States

9:45
Invited Journal Author
10.1109/JSEN.2023.3246505: Excellent Responsivity and Low Dark Current Obtained with Metal-Assisted Chemical Etched Si Photodiode
Kexun Chen, Olli E. Setälä, Xiaolong Liu, Behrad Radfar, Toni P. Pasanen, Michael D. Serué, Juha Heinonen, Hele Savin, Ville Vähänissi
Aalto University, Finland

10:00
Invited Journal Author
10.1109/LSENS.2022.3159761: A Compact and Sensitive Time-Resolved-Optical-Reader for Bioassay Using Low-Energy Excitable and Long-Lived-Fluorescence Nanolabels
Tristan Hegseth, Bryan Lee, David Aucoin, Xiaoshan Zhu
University of Nevada Reno, United States

10:15
Invited Journal Author
10.1109/JSEN.2023.3242330: Calibrating a Radio Frequency Electrooptic Sensors for Field-Relevant Temperature Conditions in a Laboratory Setting
Michael Sherburne{2}, Cameron Harjes{1}, Hugh Pohle{1}, Jane Lehr{3}
{1}Air Force Research Laboratory, United States; {2}Johns Hopkins University Applied Physics Laboratory, United States; {3}University of New Mexico, United States

9:30 - 10:30
B2L-06: MEMS Technology and Applications
Room: Park Suite 6
Session Chair(s): Ive Weygers, *Friedrich-Alexander-Universität Erlangen-Nürnberg*
Ingrid Ullmann, *Friedrich-Alexander-Universität Erlangen-Nürnberg*

9:30
Sensors Letters Paper
2107: A New Design Strategy for Innovative MEMS xz-Biaxial Accelerometers
Chiara Galimberti{1}, Gabriele Gattere{2}, Manuel Riani{2}, Valentina Zega{1}
{1}Politecnico di Milano, Italy; {2}STMicroelectronics, Italy

9:45

Sensors Letters Paper

2126: A 9-Ma Integrated Circuit with Programmable phase-Demodulation Delays for 250-nm-gauge-Based MEMS Gyroscope with 0.015°/√hr Angle Random walk

Marco De Pace{2}, Andrea Buffoli{2}, Giacomo Langfelder{2}, Marco Gadola{2}, Philippe Robert{1}
{1}CEA-Leti, France; {2}Politecnico di Milano, Italy

10:00

Sensors Letters Paper

2127: Low Motion Amplitude Operation of Lissajous Frequency Modulated MEMS Gyroscopes for Spurious Harmonics Reduction

Riccardo Nastri{1}, Christian Padovani{1}, Marco Bestetti{1}, Valentina Zega{1}, Luca Falorni{2}, Giacomo Langfelder{1}
{1}Politecnico di Milano, Italy; {2}STMicroelectronics, Italy

10:15

Sensors Letters Paper

2097: Metasurface-Enhanced Micromechanical Photoswitch for Zero Power Human Presence Sensing

Sila Calisgan{1}, Sungho Kang{1}, Antea Risso{1}, Vageeswar Rajaram{1}, Bernard Herrera Soukup{2}, Zhenyun Qian{1}, Matteo Rinaldi{1}
{1}Northeastern University, United States; {2}Northeastern University, Qualcomm Incorporated, United States

9:30 - 10:30
B2L-07: Chemical, Electrochemical and Gas Sensors - 4
Room: Park Suite 7
Session Chair(s): Hamida Hallil Abbas , *Bordeaux University*
Session Chair(s): Xiaoshan Zhu, *Universityof Nevada Reno*

9:30

1176: Responsive PAAM/PEDOT:PSS Hydrogel Based Electrochemical Sensor for Glutathione Detection

Shanshan Zhang, Yue Zhou, Dong Wang, Tianyu Li, Xuesong Ye, Bo Liang
Zhejiang University, China

9:45

1174: Universal Data Acquisition System for Flexible and MEMS-Based Gas Sensors

Wangze Ni{2}, Tao Wang{2}, Yu Wu{3}, Jianbo Zhu{1}, Yongwei Zhang{2}, Min Zeng{2}, Jianhua Yang{2}, Nantao Hu{2}, Zhi Yang{2}
{1}Alwhales Electronic Technology Shanghai Co., Ltd., China; {2}Shanghai Jiao Tong University, China; {3}Shanghai Marine Diesel Engine Research Institute, China

10:00

1558: Real-Time Monitoring of Inflammation in Metabolic Syndrome with Electrochemical Detection of Tyramine Level in Urine

Tanzila Noushin{2}, Jinwon Jeong{1}, Jeong-Bong Lee{2}
{1}Baylor University, United States; {2}University of Texas at Dallas, United States

10:15
1021: Odors Can Be Amplified by Noses: Sensitivity Enhancing Bio-Inspired Nasal Structures for Micro Cataluminescence Gas Sensors
Luzheng Liu, Chuxiong Hu, Jichuan Yu, Wenxiang Zhao, Ze Wang, Yu Zhu
Tsinghua University, China

9:30 - 10:30
B2L-08: Sensor Phenomenology, Modeling and Evaluation - 2
Room: Park Suite 8
Session Chair(s): Behraad Bahreyni, *Simon Fraser University*

9:30
1486: Adaptive 3-Mode Thermal Flow and Velocity Sensor
Ethan Gardner{2}, Chris Rosser{1}, Jonathan Hardie{1}, Jon Callan{1}, Cerdin Lee{1}, Syed Zeeshan Ali{1}, Florin Udrea{2}
{1}Flusso Ltd, United Kingdom; {2}University of Cambridge, United Kingdom

9:45
1754: A Direct Piezoresistive Method to Transduce Electromechanical Motion in Self-Sensing Suspended Nanostructures
Sudarsan Majumder, Soumya Dutta
Indian Institute of Technology Madras, India

10:00
1293: Application of an Optimization Algorithm to Reduce Crosstalk in Voltage Feedback Methods
Sergio Domínguez-Gimeno, Raúl Igual-Catalán, Carlos Medrano-Sánchez, Inmaculada Plaza-García
Universidad de Zaragoza, Spain

10:15
1212: Identification of Axon Bendings in Neurons by Multiphysics FEM Simulations of High-Density MEA Extracellular Recordings
Federico Leva{3}, Andrea Corna{1}, Paul Werginz{1}, Pierpaolo Palestri{2}, Günther Zeck{1}, Luca Selmi{3}
{1}Technische Universität Wien, Austria; {2}Università degli Studi di Udine, Italy; {3}Università di Modena e Reggio Emilia, Italy

10:30 - 11:00
Coffee Break/Exhibit Hall
Room: Grand Klimt Hall

11:00 - 12:00
Keynote NEMS and sensing – from classical to quantum
Michael L. Roukes, *Caltech, USA*
Room: Grand Park Hall
Session Chair(s): Thilo Sauter, *TU Wien and Danube University Krems*
Ravinder Dahiya, *Northeastern University, Boston*

12:00 - 13:30
Lunch
Room: Restaurant LENZ & Selleny´s Bar

12:00 - 13:30
WiSe Networking Lunch
Room: Restaurant LENZ & Selleny´s Bar

13:30 - 15:30
B3L-01: Biosensors: Materials and Applications
Room: Park Suite 1
Session Chair(s): Sameer Sonkusale, *Tufts University*
Session Chair(s): Ajay Beniwal, *University of Glasgow*

13:30
Sensors Letters Paper
1988: Impedance Spectroscopy Based Detection of Viral RNA from Clinical Samples
Ranamay Saha{1}, Sri Niwas Singh{1}, Jasmine Samal{2}, Ekta Gupta{2}, Shantanu Bhattacharya{1}
{1}Indian Institute of Technology Kanpur, India; {2}Institute of Liver and Biliary Sciences, India

13:45
Sensors Letters Paper
2111: Graphene-Oxide-Assisted Biosensor with Optimum Response Selection Algorithm for Detecting and Quantifying Vimentin, a Potential Biomarker for Ovarian Cancer
Ullas Pandey{2}, Tushar Deshpande{3}, Amit Agrawal{1}, Shiv Govind Singh{2}
{1}Indian Institute of Technology Bombay, India; {2}Indian Institute of Technology Hyderabad, India; {3}Indian Institute of Technology, Hyderabad, India

14:00
Sensors Letters Paper
1949: Direct Competitive Assay for ERBB2 Detection in Breast Cancer Cell Lysates Using 1D Photonic crystals-Based Biochips
Alberto Sinibaldi{2}, Matteo Allegretti{3}, Norbert Danz{1}, Elena Giordani{3}, Peter Munzert{1}, Agostino Occhicone{2}, Patrizio Giacomini{3}, Francesco Michelotti{2}
{1}Fraunhofer Institute for Applied Optics and Precision Engineering IOF, Germany; {2}Sapienza Università di Roma, Italy; {3}Translational Oncology Research Unit, IRCCS Regina Elena National Cancer Institute, Italy

14:15
Sensors Letters Paper
2090: Non-Enzymatic Glucose Sensing Employing a Patterned Substrate Miniaturized Device-on-Mask
Subham Das, Vibhas Chugh, Chirantan Das, Mitradip Bhattacharjee
Indian Institute of Science Education and Research, Bhopal, India

14:30
Sensors Letters Paper
2087: Detection of Lactate via Amperometric Sensors Modified with Direct Electron Transfer Enzyme Containing PEDOT:PSS and Hydrogel Inks
Steffen Kurzhals{2}, Eva Melnik{2}, Paulina Plata{2}, Esra Cihan{1}, Peter Herzog{3}, Alfons Felice{3}, Andrea Bocchino{4}, Conor O'mahony{4}, Giorgio C. Mutinati{2}, Rainer Hainberger{2}
{1}AIT Austrian Institute of Technology GmbH, Austria; {2}Austrian Institute of Technology GmbH, Austria; {3}Directsens GmbH, Austria; {4}Tyndall National Institute, University College Cork, Ireland

14:45

Sensors Letters Paper

2016: New Insights Into the I/V Hysteretic Characteristics of Memristive Biosensors

Kapil Bhardwaj{2}, Ata Golparvar{3}, Junrui Chen{1}, Gian Luca Barbruni{1}, Sandro Carrara{1}
{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}École Polytechnique Fédérale de Lausanne / NIT Jamshedpur, Switzerland; {3}Sabanci University, École Polytechnique Fédérale de Lausanne, Switzerland

15:00

Sensors Letters Paper

2061: Single-Band Raman Shift Detection for Spectroscopy-Less Optical Biosensors

Ata Golparvar{2}, Assim Boukhayma{3}, Sandro Carrara{1}
{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}Sabanci University, École Polytechnique Fédérale de Lausanne, Switzerland; {3}Senbiosys SA, Switzerland

15:15

Sensors Letters Paper

2012: Multiplexed Sensing Probe for Bioreactors for Cellular Agriculture

Atul Sharma, Cihan Asci, Ruben Del-Rio-Ruiz, Kirsten Trinidad, Nafize Ishtiaque Hossain, David L Kaplan, Sameer Sonkusale
Tufts University, United States

13:30 - 15:30
B3L-02: Advanced Chemical and Bio-Sensors
Room: Park Suite 2
Session Chair(s): Bérengère Lebental, *Université Gustave Eiffel*
Michael Sherburne, *The Johns Hopkins University Applied Physics Laboratory*

13:30

Invited Journal Author

10.1109/JSEN.2022.3233571: Electric Field Sensors Approach to Determine Fidelity and Overmoding Region of GTEM Cell

Michael Sherburne{2}, Heather Sommerdyke{1}, Nicholas Erickson{1}, Cameron Harjes{1}, Jeremy McConaha{1}, Hugh Pohle{1}
{1}Air Force Research Laboratory, United States; {2}Johns Hopkins University Applied Physics Laboratory, United States

13:45

Invited Journal Author

10.1109/JSEN.2023.3238900: Uncertainty-Based Calibration Method for Environmental Sensors—Application to Chlorine and Ph Monitoring with Carbon Nanotube Sensor Array

Guillaume Perrin, Bérengère Lebental
Université Gustave Eiffel, France

14:00

Invited Journal Author

10.1109/JSEN.2023.3240069: Molecularly Imprinted Polymer-Based Electrode for Tannic Acid Detection in Black Tea

Madhurima Moulick{1}, Debangana Das{2}, Shreya Nag{3}, Bipan Tudu{1}, Rajib Bandyopadhyay{1}, Runu Banerjee Roy{1}
{1}Jadavpur University, India; {2}Silicon Institute of Technology, India; {3}University of Engineering & Management, Kolkata, India

14:15

Invited Journal Author

10.1109/JSEN.2023.3259420: Microscopy-Guided 3-D Reconstruction of Nanodendrites in Biosensors

Sue-Yuan Fan, Yi-Pin Huang, Sucharita Khuntia, Jen-Wen Chang, Ci-Ruei Liou, Bing Zhang, Li-Chia Tai
National Yang Ming Chiao Tung University, Taiwan

14:30

Invited Journal Author

10.1109/JSEN.2023.3240292: A spectroscopy-based sensor for the AI-based classification of lipemic and hematic parameters

Laura Carletti{2}, Davide Bagnoli{1}, Davide Paci{1}, Gastone Ciuti{2}
{1}Medica S.p.A., Italy; {2}Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna, Italy

14:45

Sensors Letters Pape

1946: Polypyrrole Nanoparticles Suspended on Graphene for the Detection of Simulant Chemical Warfare Agents

Juan Casanova-Chafer{2}, Xavier Blanch{1}, Eduard Llobet{1}
{1}Universitat Rovira i Virgili, Spain; {2}Université de Mons, Belgium

15:00

Sensors Letters Pape

2146: Adipose tissue characterization with electrical impedance spectroscopy and machine learning

Florian Dapsance, Jie Hou, Damien Dufour, Charlotte Boccara, Nolwenn Briand, Ørjan Grøttem Martinsen
University of Oslo, Norway

13:30 - 15:30
B3L-03: Advanced Fiber-optic Sensors
Room: Park Suite 3
Session Chair(s): Xiaoshan Zhu, *Universityof Nevada Reno*
Mona Jarrahi, *UCLA*

13:30
Invited Journal Author
10.1109/JSEN.2023.3240292: The Influence of Geometric Shape on the Performance of Refractive Index Sensors Based on Plastic Optical fibers: Simulations and Experimental Assessment
Juan David Lopez Vargas{1}, Alex Dante{3}, Regina Celia Allil{2}, Marcelo Martins Werneck{2}
{1}COPPE, Federal University of Rio de Janeiro, Brazil; {2}Electric Engineering Program – COPPE, Federal University of Rio de Janeiro, Brazil, Brazil; {3}International Iberian Nanotechnology Laboratory, INL, Braga 4715-330, Portugal, Portugal

13:45
Invited Journal Author
10.1109/JSEN.2022.3229133: Light Diffusing Optical Fiber Sensor for Distributed Optical Absorption Spectroscopy and Chemical Sensing
Gianluca Persichetti{2}, Genni Testa{1}, Pasquale Imperatore{1}, Romeo Bernini{1}
{1}CNR-IREA, Italy; {2}National Research Council of Italy CNR-IREA, Italy

14:00
Invited Journal Author
10.1109/JSEN.2023.3242934: High-Resolution Slow-Light Fiber-Bragg-Grating Microphone and Hydrophone
Adele Zawada{1}, Arushi Arora{1}, Martin Bernier{2}, Michel Digonnet{1}
{1}Stanford University, United States; {2}Université Laval, Canada

14:15
Invited Journal Author
10.1109/JSEN.2023.3236257: Fiber-Optic Sensor for Directional Bending Monitoring Based on a Pattern Recognition Algorithm
Rodolfo Martínez-Manuel{1}, Jonathan Esquivel-Hernández{1}, Luis M. Valentín-Coronado{1}, Sophie Larochelle{2}
{1}Centro de Investigaciones en Óptica, A.C., Mexico; {2}Université Laval, Canada

14:30
Invited Journal Author
10.1109/JSEN.2023.3258423: An MR Compatible Vascular Stenosis Method Based on Fiber Bragg Grating
Tianxue Zhang{1}, Anzhu Gao{2}, Guang-Zhong Yang{2}
{1}Beihang University, China; {2}Shanghai Jiao Tong University, China

14:45

Invited Journal Author

10.1109/JSEN.2023.3246056: Triaxial Accelerometer Based on a Semicircular Hetero-Core Fiber-Optic Sensor

Miyuki Kadokura{3}, Hiroshi Yamazaki{1}, Tokio Kasai{2}, Kazuhiro Watanabe{3}, Michiko Nishiyama{3}
{1}Core System Japan Company Ltd., Japan; {2}Japan Aerospace Exploration Agency, Japan; {3}SOKA University, Jordan; {3}SOKA University, Japan

15:00

Sensors Letters Paper

2102: Das Transducer for Enhanced Acoustic Sensitivity

Danilo Fernandes Gomes{3}, Guilherme Heim Weber{3}, Daniel Rodrigues Pipa{3}, Marco Jose Da Silva{1}, Jean Carlos Cardozo Da Silva{3}, Sérgio Taveira de Camargo Júnior{2}, Manoel Feliciano Da Silva{2}, Cicero Martelli{3}
{1}Johannes Kepler Universität Linz, Austria; {2}Petrobras Research and Development Program, Brazil; {3}Universidade Tecnológica Federal do Paraná, Brazil

13:30 - 15:30
B3L-04: Wearable Sensors and Systems - 2
Room: Park Suite 4
Session Chair(s): Sahika Inal, *King Abdullah University of Science and Technology (KAUST)*
Jürgen Kosel, *Silicon Austria Labs (SAL)*

13:30

1428: Wearable Near-Infrared Organic Photodiode Arrays for Cardiovascular Health Monitoring and Biomarker Mapping - Signal-to-Noise Ratio Enhancement Using Machine Learning

Ahmad Khatoun, Adrian-Razvan Petre, Bart Peeters, Albert Vanbreemen, Hylke Akkerman
TNO - Holst centre, Netherlands

13:45

1505: Smart Insole: Stand-Alone Soft 3-Axis Force Sensing Array in a Shoe

Jian Gao{4}, Zihao Pu{4}, Ruixin Qiu{4}, Ying Li{4}, Xiulun Yin{4}, Kieran Morton{4}, Sadan Wani{4}, Justin Wyss{4}, Michael Steszyn{3}, Ryusuke Ishizaki{2}, Fumiya Hamatsu{1}, Takeshi Ohsato{1}, John D.W. Madden{4}
{1}Honda R&D Co., Ltd, Japan; {2}Honda R&D Co., Ltd, Frontier Robotics Honda R&D, Japan; {3}i-generator, United States; {4}University of British Columbia, Canada

14:00

1594: Conformal Micropatterned Organic-Metal Electrodes for Physiological Recording

Kirstie Queener{3}, Parvez Ahmmed{2}, Mauro Victorio{1}, Jack Twiddy{3}, Ashley Dehn{3}, Alec Brewer{2}, Edgar Lobaton{3}, Alper Bozkurt{2}, Vladimir Pozdin{1}, Michael Daniele{3}
{1}Florida International University, United States; {2}North Carolina State University, United States; {3}North Carolina State University, University of North Carolina at Chapel Hill, United States

14:15

1682: Stretchable Microscale Patterned Interconnects Formed on Micro-Corrugated Vertical Wavy Structured Substrate

Michitaka Yamamoto, Seiichi Takamatsu, Toshihiro Itoh
University of Tokyo, Japan

14:30
1720: Towards Wearable-Based Lung Sound Intensity Assessment Leveraging Impedance Pneumography
Jesus Antonio Sanchez-Perez, Samer Mabrouk, Goktug Ozmen, John Berkebile, Omer Inan
Georgia Institute of Technology, United States

14:45
1735: Highly Sensitive Mach-Zehnder Interferometer Glucose Biosensor with Subwavelength Grating in Flexible Substrate
Faiz Ul-Hassan, Nabarun Saha, Giuseppe Brunetti, Caterina Ciminelli
Politecnico di Bari, Italy

15:00
1761: A Metal Nanoparticles and 2D-Siloxene Sheets Incorporated Laser-Ablated Graphene-Based Epidermal Patch for Electrolytes Analysis and Monitoring
Md Asaduzzaman, Xue Hui, Ye Young Lee, Jae Yeong Park
Kwangwoon University, Korea

15:15
1874: Flexible Hybrid Intraoral Sleep Monitoring System
Seyedfakhreddin Nabavi, John Cogan, Asim Roy, Brandon Canfield, Robert Kibler, Collin Emerick
Dianyx Innovations LLC, United States

13:30 - 15:30
B3L-05: Microfluidics and Biomedical Applications
Room: Park Suite 5
Session Chair(s): Uwe Schnakenberg, *RWTH Aachen University*
Hyejin Moon, *The University of Texas at Arlington*

13:30
1543: Acoustofluidic Trapping in Structured Microchannels Using Lateral Transducer Modes
Andreas Fuchsluger{1}, Annalisa De Pastina{2}, Tina Mitteramskogler{1}, Rafael Ecker{1}, Thomas Voglhuber-Brunnmaier{1}, Nikolai Andrianov{2}, Alexander Shatalov{2}, Norbert Cselyuszka{2}, Mohssen Moridi{2}, Bernhard Jakoby{1}
{1}Johannes Kepler Universität Linz, Austria; {2}Silicon Austria Labs GmbH, Austria

13:45
1744: A Pump-Free Optofluidic Biosensing Platform Based on Whispering Gallery Mode Microspheres
Bin Guan{3}, Tuck-Weng Kok{2}, Nicolas Riesen{3}, David Lancaster{3}, Koukou Suu{1}, Craig Priest{3}
{1}ULVAC Inc., Japan; {2}University of Adelaide, Australia; {3}University of South Australia, Australia

14:00
1114: Quantitative Evaluation of Dielectrophoretic Captured Fluorescent-Labeled Exosomes
Ryu Nakabayashi, Rie Koyama, Masafumi Inaba, Michihiko Nakano, Junya Suehiro
Kyushu University, Japan

14:15
1325: Deep Learning-Based Droplet Menisci Recognition for Digital Microfluidic Devices
Negar Danesh{2}, Matin Torabinia{1}, Hyejin Moon{2}
{1}GenMark Diagnostics, United States; {2}University of Texas at Arlington, United States

14:30
1790: Microfluidic Nanospray Emitters with a Liquid Junction for Sensitive Bioanalyses
Elizaveta Vereshchagina{2}, Tomáš Václavek{1}, Anand Summanwar{2}, Sigurd Moe{2}, Leny Nazareno{2}, Guido Sordo{2}, Anna Nordborg{3}, Andreas Vogl{2}, František Foret{1}, Roman ?emínek{1}
{1}Institute of Analytical Chemistry of the Czech Academy of Sciences, Czech Rep.; {2}SINTEF Digital, Norway; {3}SINTEF Industry, Norway

14:45
1413: Development and Evaluation of a Microwire Biosensor for the Detection of Fumarate
Dafydd Ravenscroft, Luigi G. Occhipinti
University of Cambridge, United Kingdom

15:00
1408: Advancing Sensitivity in Measuring Cardiomyocyte Contraction Force Through Single-Crystal Silicon Strain Sensors
Haolan Sun, Dong-Su Kim, Jong-Yun Kim, Yun-Jin Jeong, Dong-Weon Lee
Chonnam National University, Korea

15:15
1760: Implanted Stretch Sensor for Blood Pressure Measurement: Pig Study and Benchtop Evaluation
Jeremiah Ukwela{1}, Lauren Le Barron{2}, Jeremy Dunning{3}, Jonathan Baskin{1}, Steve Majerus{1}
{1}Case Western Reserve University, United States; {2}Case Western Reserve University School of Medicine, United States; {3}Louis Stokes Cleveland Veterans Affairs Medical Center, United States

13:30 - 15:30
B3L-06: Acoustic and Ultrasonic Sensors
Room: Park Suite 6
Session Chair(s): Hongyu YU, *Hong Kong University of Science and Technology*
Haifeng Zhang, *University of North Texas*

13:30
INVITED
1915: Portable Ultrasound and Wearable Ultrasound: a Pathway to Disruptive Medical Device Technologies
Dawei Wu
State Key Laboratory of Mechanics and Control for Aerospace Structures?Nanjing University of Aeronau, China

13:45
1832: A Highly Sensitive Surface Acoustic Wave Sensor for Continuous Respiratory Monitoring
Seyedfakhreddin Nabavi, Amir-Reza Kolahdouz Moghadam, Salar Salahi
nditive3d Inc., Canada

14:00
1142: Sensitivity-Enhanced Piezoelectric Humidity Sensor Based on a Parity Time Symmetric System Biased at the Exceptional Point
Zhenyu Wei, Jianqiu Huang, Qing'An Huang
Southeast University, China

14:15
1167: DC Bias Effects on Optimizing ScAlN Air-Coupled pMUT Performance Parameters
David Sze Wai Choong{1}, Duan Jian Goh{1}, Jihang Liu{1}, Mantalena Sarafianou{1}, Srinivas Merugu{1}, Qing Xin Zhang{1}, Peter Hyun Kee Chang{1}, Alberto Leotti{3}, Goutham Koppisetti{3}, Naadaa Zakiyyan{3}, Huamao Lin{1}, Chandra Bhasetti{1}, Sagnik Ghosh{1}, Prakasha Chigahalli Ramegowda{1}, Daniel Chen{1}, Joshua En-Yuan Lee{1}, Carlo Prelini{3}, Domenico Giusti{3}, Alessandro Savoia{2}, Yul Koh{1}
{1}Institute of Microelectronics, Agency for Science, Technology and Research, Singapore; {2}Roma Tre University, Italy; {3}STMicroelectronics, Italy; {3}STMicroelectronics, Singapore

14:30
1476: Non-Contact Lamb Wave Defect Detection Based Solely on Air-Coupled Ultrasonic Phased Arrays
Felix Laub, Christoph Haugwitz, Gianni Allevato, Julian Seiler, Rolf Findeisen, Mario Kupnik
Technische Universität Darmstadt, Germany

14:45
1064: Ultrasonic Sensor for Pipe Joint Make-Up Assessment
Esteban Cabanillas{1}, Julien Marianne{2}, Ghislain Despesse{1}, Nicolas Garraud{1}, Jean-Yves Burlet{1}, Baptiste Alessandri{1}, Olivier Freychet{1}, Sebastien Petit{3}, Tristan Caroff{1}
{1}CEA-Leti, France; {2}SERMA Technologies and SERMA Ingénierie, CEA, France; {3}Vallourec One R&D, France

15:00
1019: A MEMS Capacitive Resonator as an Acoustic Sensor for Photoacoustic Spectroscopy
Yonggang Yin, Danyang Ren, Yuqi Wang, Da Gao, Junhui Shi
Zhejiang Lab, China

13:30 - 15:30
B3L-07: Sensor Systems and Processing
Room: Park Suite 7
Session Chair(s): Chang-hee Won, Temple University

13:30
1105: Length-Adaptive Linear Position Sensing System Based on De-Bruijn Sequence
Kai-Yang Peng{1}, Heng-Sheng Hsiao{1}, Jen-Yuan Chang{2}
{1}National Tsing Hua University, Taiwan; {2}National Tsing Hua University, National Formosa University, Taiwan

13:45
1854: Towards Digital Synthesis of Variable Q-Factor Direct-Conversion for Low-Power Edge Sensing
Parthojit Chakraborty, Kazuki Maari, Jim Bartels, Alexandre Varieras, Aravind Tharayil Narayan, Ludovico Minati, Shiro Dosho, Hiroyuki Ito
Tokyo Institute of Technology, Japan

14:00
1792: MC-RMA: Multi-Coset Range Migration Algorithm for Near-Field MIMO-SAR Imaging
Andrew Gigie, Rokkam Krishna Kanth, Achanna Anil Kumar, Tapas Chakravarty, Arpan Pal
TATA Consultancy Services Limited , India

14:15
1608: Camera Placement Optimization for a Novel Modular Robot Tracking System
Jan Baumgrtner{1}, Bernd Bertschinger{2}, Kathrin Hoffmann{2}, Alexander Puchta{1}, Oliver Sawodny{2}, Stephan Reichelt{2}, Jrgen Fleischer{1}
{1}Karlsruher Institut fr Technologie, Germany; {2}Universitt Stuttgart, Germany

14:30
1846: Online Demodulation of Miniatured Capacitive Angular Position Sensor Based on ASIC Implementation
Jiahui Shi, Bowen Xing, Bin Zhou, Qi Wei, Rong Zhang
Tsinghua University, China

14:45
1870: Two-Dimensional Waterflow Sensor Using Multiple Absolute Pressure Sensors
Kyota Shimada{1}, Takuto Kishimoto{1}, Hiroto Tanaka{2}, Hidetoshi Takahashi{1}
{1}Keio University, Japan; {2}Tokyo Institute of Technology, Japan

15:00
1631: A 30-nΩ Accuracy Low Power Two-Step Ratiometric Shunt Resistance Measurement System Using a Switching Regulator-Based Current Generator for Shunt-Based Current Sensors
Shogo Kawahara, Yoshikazu Furuta, Shotaro Wada, Soya Taniguchi, Tomohiro Nezuka
MIRISE Technologies Corporation, Japan

15:15
1410: High Frequency Audio Devices Based Inaudible Ultrasonic Hand Tracking System Using Subspace Method
Xu Cheng, Xiangyu Li
Tsinghua University, China

13:30 - 15:30
B3L-08: Sensor Data Processing & AI: Industrial and Environmental Applications
Room: Park Suite 8
Session Chair(s): Markus Neumayer, *Graz University of Technology*

13:30
1200: Hardware Accelerators for a Convolutional Neural Network in Condition Monitoring of CNC Machines
Ingo Hoyer{1}, Oscar Berg{1}, Lukas Krupp{1}, Alexander Utz{1}, Christian Wiede{1}, Karsten Seidl{2}
{1}Fraunhofer Institute for Microelectronic Circuits and Systems IMS, Germany; {2}Fraunhofer Institute for Microelectronic Circuits and Systems IMS, University of Duisburg-Essen, Germany

13:45
1256: Fault Detection on Variable Length Multivariate Time Series from Semiconductor Manufacturing
Philip Tchatchoua{1}, Guillaume Graton{1}, Mustapha Ouladsine{1}, Jean-François Christaud{2}
{1}Aix Marseille Université, France; {2}STMicroelectronics, France

14:00
1489: Statistical Approach for Preload Monitoring of Ball Screw Drives
Jana Mayer{2}, Vesa Klumpp{2}, Jonas Hillenbrand{1}, Benjamin Noack{3}
{1}August Steinmeyer GmbH & Co. KG, Germany; {2}Knowtion GmbH, Germany; {3}Otto von Guericke Universität Magdeburg, Germany

14:15
1347: A Low Power AI Hardware Accelerator for Microwave-Based Ice Detection
Dima Kilani, Mohammad H. Zarifi
University of British Columbia, Canada

14:30
1601: Neural Networks for Defect Detection on Eddy-Currents-Based Non-Destructive Testing
Diogo Miguel Bárbara Caetano{1}, Luis S. Rosado{3}, Jorge R. Fernandes{2}, Susana Cardoso{1}
{1}INESC MN, Instituto Superior Técnico, Universidade de Lisboa, Portugal; {2}INESC-ID, Instituto Superior Técnico, Universidade de Lisboa, Portugal; {3}Instituto Superior Técnico, Universidade de Lisboa, Portugal

14:45
1151: Visual Force Sensor to Estimate External Force Distributions from Shape Deformation
Ryuichi Ikeya, Yoshifumi Nishida
Tokyo Institute of Technology, Japan

15:00
1059: Forecasting Task Optimization for a New Architecture of MEMS Reservoir Computing Using Stiffness Modulation
Xiaowei Guo, Wuhao Yang, Xudong Zou
State Key Laboratory of Transducer Technology, Aerospace Information Research Institute, UCAS, China

15:15
1288: A Calibration Process for Environmental Sensor Array Supporting Uncertainties and Unknown Perturbing Factors: Performances on Simulated and Real Data
Marine Dumon{1}, Bérengère Lebental{2}, Guillaume Perrin{2}
{1}IMSE, Université Gustave Eiffel, France; {2}Université Gustave Eiffel, France

15:30 - 15:45
Coffee Break/ Exhibit Hall
Room: Grand Park Hall Lobby

15:45 - 17:00
Sensors Council 25th Anniversary Talk: Technologies for a Sustainable Future
Room: Grand Park Hall
Session Chair(s): Ravinder Dahiya, *Northeastern University, Boston*

17:00 - 17:30
Sensors Council Awards Ceremony
Room: Grand Park Hall
Session Chair(s): Ravinder Dahiya, *Northeastern University, Boston*

19:00 - 23:30
Sensors Council 25th Anniversary Ball
Room: The Hofburg

8:00 - 9:00
Registration
Room: Grand Park Lobby

9:00 - 10:00
Keynote: Secrets of the Universe, Technological Advances and Why Should I Care!
Archana Sharma, *CERN, Switzerland*
Room: Grand Park Hall
Session Chair(s): Thilo Sauter, *TU Wien and Danube University Krems*
Ravinder Dahiya, *Northeastern University, Boston*

10:00 - 10:30
Coffee Break/ Exhibit Hall
Room: Grand Klimt Hall

10:30 - 12:00
C1L-01: Healthcare: Diagnostics and Monitoring
Room: Park Suite 1
Session Chair(s): Jung-Chih Chiao, *Southern Methodist University*
Chang-hee Won, *Temple University*

10:30
Sensors Letters Paper
2011: A Wearable and Multiplexed Electrochemical Sensor Suite for Real-Time Sweat Ionic Content and Ph Monitoring with IoT Integration
Nafize Ishtiaque Hossain, Atul Sharma, Sameer Sonkusale
Tufts University, United States

10:45
Sensors Letters Paper
2096: Simultaneous Measurement of Respiratory and Pulse Information Using a Patch-Type Sensor for Sleep Apnea Hypopnea Detection
Yukino Ota{1}, Tomoki Yoshida{2}, Hiroshi Nagaoka{2}, Masaki Takahashi{1}
{1}Keio University, Japan; {2}Signtle Inc., Japan

11:00
Sensors Letters Paper
1965: Heart Side-Channel: Estimation of Cardiovascular Signal Waveforms Through Skin Vibration Sensing
Shun Hinatsu{1}, Masamichi Tanji{1}, Hiroki Ishizuka{2}, Sei Ikeda{2}, Osamu Oshiro{2}
{1}Mitsubishi Electric Corporation, Japan; {2}Osaka University, Japan

11:15
Sensors Letters Paper
2067: Simultaneous and Selective Detection of Etoposide and Methotrexate with Single Electrochemical Sensors for Therapeutic Drug Monitoring
Francesca Rodino{2}, Mattia Bartoli{1}, Sandro Carrara{2}
{1}Center for Sustainable Future Technologies CSFT, Politecnico di Torino, Italy; {2}École Polytechnique Fédérale de Lausanne, Switzerland

11:30

Sensors Letters Paper

1948: Constructing and Testing a Lightweight Model of Converting Single Stride of In-Shoe-Motion-Sensor-Measured Foot Motion to TUG-Represented Mobility

Chenhui Huang, Fumiyuki Nihey, Kenichiro Fukushi, Hiroshi Kajitani, Yoshitaka Nozaki, Kentaro Nakahara
NEC Corporation, Japan

11:45

Sensors Letters Paper

2086: Miura-ori Microstructure Enhanced Flexible Piezoresistive Pressure Sensor for Human Physiological Signal Monitoring

Ruoqin Wang, Rui Jiao, Yiting Li, Yang Li, Yixin Wang, Qian Xu, Zhigang Li, Hongyu Yu
Hong Kong University of Science and Technology, China

10:30 - 12:00
C1L-02: Chemical Sensors
Room: Park Suite 2
Session Chair(s): Urvashi P. Shukla, *Banasthali Vidyapith*

10:30

Sensors Letters Paper

2070: Improvement on Potential Drifting for Sol–gel and Electroplated Iridium Oxide-Based Ph Sensing Films

Khengdauliu Chawang{1}, Xing Xia{2}, Mao-Hsiang Huang{2}, Sen Bing{1}, Mohamed Benomar{2}, Gabriella Doan{1}, Hung Cao{2}, Jung-Chih Chiao{1}
{1}Southern Methodist University, United States; {2}University of California, Irvine, United States

10:45

Sensors Letters Paper

2105: Room Temperature Operated PEDOT:PSS Based Flexible and Disposable NO2 Gas Sensor

Ajay Beniwal{3}, Priyanka Ganguly{2}, Rahul Gond{1}, Brajesh Rawat{1}, Chong Li{3}
{1}Indian Institute of Technology Ropar, India; {2}London Metropolitan University, United Kingdom; {3}University of Glasgow, United Kingdom

11:00

Sensors Letters Paper

2075: Development of a sub-10-Ppm Limit of Detection Lateral Nanogap Gas Sensor

Sayali Tope, Seungbeom Noh, Rana Dalapati, Ling Zang, Hanseup Kim
University of Utah, United States

11:15

Sensors Letters Paper

1961: Subpixel Patterned LSPR Gas Sensor Array with Using Inkjet Printing Au/Ag Nanoparticle to Enhance the Selectivity

Tianshu Jiang, Xiao Ye, Lingpu Ge, Hao Guo, Fumihiro Sassa, Kenshi Hayashi
Kyushu University, China; Kyushu University, Japan

11:30
Sensors Letters Paper
1955: Pattern Recognition Using Chemical Sensor for Identification of Solid Materials by Responses to Multiple Probe Gases
Kosuke Minami, Kota Shiba, Genki Yoshikawa
National Institute for Materials Science NIMS, Japan

11:45
Sensors Letters Paper
2078: Resistive Ion Sensors Based on Metal-Oxide-Semiconductor Nanostructures Formed by Heating Metal Foil
Yoshinari Kimura, Hironori Tohmyoh
Tohoku University, Japan

10:30 - 12:00
C1L-03: Bio-Remote Sensing and Integrated Artificial Intelligence Systems
Room: Park Suite 3
Session Chair(s): Paddy French, *TU Delft*
Kianoush Rassels, *TU Delft*

10:30
INVITED
1917: Current Developments and Future Directions in Using IMUs for Injury Prevention in Running
Jasper Reenalda
University of Twente, Netherlands

11:00
1619: Detecting ADHD from Speech Using Full-Band and Sub-Band Convolution Fusion Network
Shuanglin Li{2}, Rajesh Nair{1}, Mohsen Naqvi{2}
{1}CNTW-NHS Foundation Trust, United Kingdom; {2}Newcastle University, United Kingdom

11:15
1376: Wireless Skin Temperature Monitoring for Microwave Hyperthermia: Feasibility Study of an Epidermal RFID Sensor Grid
Francesco Lestini, Gaetano Marrocco, Cecilia Occhiuzzi
Università degli Studi di Roma Tor Vergata, Italy

11:30
1481: Novel Robust-to-Motion-Artifact Detection of Atrial Fibrillation Based on PPG Only
Ching-Hui Huang, Duc Huy Nguyen, Paul C.-P. Chao
National Yang Ming Chiao Tung University, Taiwan

11:45
1821: Augmented Implanted Orthopedic Fixators with an Embedded Temperature Sensor for Early Detection of Deep Infections
Carolina Miozzi{1}, Sara Amendola{1}, Cecilia Occhiuzzi{1}, Gaetano Marrocco{2}
{1}Radio6ense S.r.l., Italy; {2}Università degli Studi di Roma Tor Vergata, Italy

10:30 - 12:00
C1L-04: Chemical Agent Detection: Sensing Technologies and Sensing Applications
Room: Park Suite 4
Session Chair(s): Frank Sabath, *Bundeswehr Research Institute for Protective Technologies and CBRN-Protection (WIS)*

10:30
INVITED
1163: High Kinetic Energy Ion Mobility Spectrometry - A Promising Approach for Fast and Reliable Detection of Chemical Warfare Agents
Christoph Schaefer, Florian Schlottmann, Stefan Zimmermann
Leibniz Universität Hannover, Germany

11:00
1807: Development of a Lab-on-a-Chip for the Detection of Nerve Agents with a Handheld Device
Mustafa Biyikal, Knut Rurack
Bundesanstalt für Materialforschung und -prüfung BAM, Germany

11:15
1098: Bout-Based Gas Source Localization Using Aerial Robot Swarms
Felix Häusler{2}, Jan Stührenberg{2}, Patrick P. Neumann{1}, Kay Smarsly{2}
{1}Federal Institute for Materials Research and Testing, Germany; {2}Hamburg University of Technology, Germany

11:30
1745: Real-Time Detection of Chemical Compounds in Dust Particles Using a Single-Particle Mass Spectrometer and its Potential for Safety Applications
Johannes Passig{5}, Julian Schade{4}, Ellen Iva Rosewig{5}, Michael Pütz{1}, Martin Seipenbusch{2}, Sven Ehlert{3}, Heinrich Ruser{4}, Thomas Adam{4}, Andreas Walte{3}, Ralf Zimmermann{6}
{1}Forensic Science Institute KTI, BKA, Germany; {2}ParteQ GmbH, Germany; {3}Photonion GmbH, Germany; {4}Universität der Bundeswehr München, Germany; {5}University of Rostock, Germany; {6}University of Rostock, Helmholtz Zentrum München, Germany

11:45
1841: Demonstration of a Wide Range Conductivity Sensor for Buffers On-Demand Manufacturing
Anastasios Malissovas, Van Anh Dam, Greja Brom-Verheijden, Milou Jaspers, Marcel Zevenbergen
Stichting IMEC Nederland, Netherlands

10:30 - 12:00
C1L-05: Session: Actuators, Energy Harvesters and Powering Sensors
Room: Park Suite 5
Session Chair(s): Hongsoo Choi, *Daegu Gyeongbuk Institute*
Smitha Rao, *Michigan Technological University*

10:30
INVITED
1914: Self-Powered IoT Sensor System Based on Piezoelectric Magneto-Mechano-Electric Generator
Jongmoon Jang
Korea Institute of Materials Science, Korea

11:00
1296: Wireless Telemetry for Characterization of Piezoelectric Energy Harvesters in Tires
Cinzia Tamburini{1}, Matteo Pizzotti{1}, Leena Ryynänen{2}, Mika Penttilä{2}, Aldo Romani{1}
{1}Alma Mater Studiorum – Università di Bologna, Italy; {2}Nokian Tyres Plc, Finland

11:15
1518: Fabrication and Characterization of the Transparent PLZT-Based Piezoelectric Speaker
Younghyeon Lee{1}, Jong-Jin Choi{2}, Hongsoo Choi{1}, Jongmoon Jang{2}
{1}Daegu Gyeongbuk Institute of Science and Technology, Korea; {2}Korea Institute of Materials Science, Korea

11:30
1557: An Enhanced Liquid Metal Triboelectric Nanogenerator (LM-TENG) Using Parallel Placement of Friction Layer
Jinwon Jeong{1}, Tanzila Noushin{2}, Jeong Bong Lee{1}
{1}Baylor University, United States; {2}University of Texas at Dallas, United States

11:45
1231: Cantilever Actuator Capsule for Magnetically Triggered Drug Delivery in the GI Tract
Joshua Levy, Michael Straker, Luke Beardslee, Reza Ghodssi
University of Maryland, United States

10:30 - 12:00
C1L-06: Smart Biomedical Sensor Platforms in Resource Constrained Settings
Room: Park Suite 6
Session Chair(s): Shantanu Bhattacharya, *Indian Institute of Technology Kanpur*

10:30
INVITED
2049: Low Cost, Sensitive DNA-Based Point-of-Care Sensing in Under-Served Rural Communities - Development of Paper-Based Lateral Flow Tests for Infectious Diseases
Jonathan Cooper
University of Glasgow, United Kingdom

11:00
1197: TinyMM: Multimodal-Multitask Machine Learning on Low-Power MCUs for Smart Glasses
Lokmane Demagh{1}, Patrick Garda{2}, Cedric Gilbert{1}, Khalil Hachicha{2}
{1}EssilorLuxottica, France; {2}Sorbonne Universite, France

11:15
1264: Low-Cost Chipless RFID Glucose Sensor for Diabetes Screening
Pablo Garca-Cardarelli{2}, Ftima Villa-Gonzlez{3}, Mireya Vinacua{2}, Jacobo Paredes-Puente{2}, Daniel Valderas{2}, Rahul Bhattacharyya{1}
{1}Auto-ID Labs, Massachusetts Institute of Technology, United States; {2}Tecnun, Universidad de Navarra, Spain; {3}Tecnun, Universidad de Navarra, Auto-ID Labs, Massachusetts Institute of Technology, Spain

11:30
1542: Estimation of Splitting Interval in Second Heart Sound by Optimizing a Demixing Vector
Shun Muramatsu, Michitaka Yamamoto, Seiichi Takamatsu, Toshihiro Itoh
University of Tokyo, Japan

11:45
1327: Food Quality Monitoring Using a Low-Profile Multiplexed Harmonic Sensor
Zhilu Ye{2}, Yichong Ren{2}, Minye Yang{2}, Mark Ming-Cheng Cheng{1}, Pai-Yen Chen{2}
{1}University of Alabama, United States; {2}University of Illinois Chicago, United States

10:30 - 12:00
C1L-07: Optical Sensors - 2
Room: Park Suite 7
Session Chair(s): Kohei Shimasaki, *Hiroshima University*
Derryck Reid, *Heriot-Watt University*

10:30
1844: Optimization of ASE Light Source Design for Enhancement of Wavelength Stability
Erkut Emin Akba?{1}, Aylin Yertutanol{1}, Tu?ba Andaç{1}, Ekmel Özbay{1}, Yashar Azizian-Kalandaragh{2}
{1}Bilkent University Nanotechnology Research Center, Bilkent University, Turkey; {2}Gazi University, Turkey

10:45
1524: Mid-Infrared Computational Spectrometry with Wavelength-Skewed Microbolometer Arrays
Md. Rabiul Hasan, Amirali Nikeghbal, Adwait Deshpande, Mohit U. Karkhanis, Erfan Pourshaban, Md. Golam Dastagir, Aishwaryadev Banerjee, Seungbeom Noh, Hanseup Kim, Carlos H. Mastrangelo
University of Utah, United States

11:00
1727: Enhancement of Hydrogen Sensing with Multi-Reflection Raman Scattering
Yusei Yamamoto, Satoshi Umehara, Masahiro Inoue, Kugen Teii, Yoshimine Kato
Kyushu University, Japan

11:15
1480: Towards a System for Remote Emission Sensing Utilizing TDLAS for Concentration Measurement - A Promising Approach for Accurate and Direct Emission Measurements
Paul Schaffer, Hafiz Hashim Imtiaz, Benjamin Lang, Martin Kupper, Alexander Bergmann
Technische Universität Graz, Austria

11:30
1689: Monolithic Integration of Polymer and Silicon Nitride Waveguides for Optical Phased Array LiDAR Sensors
Eun-Su Lee{2}, Kwon-Wook Chun{2}, Jinung Jin{2}, Sang-Shin Lee{1}, Min-Cheol Oh{2}
{1}Kwangwoon University, Korea; {2}Pusan National University, Korea

11:45
1848: Microfluidic Surface-Enhanced Raman Scattering Sensors Based on Nanoimprint Resist for Sensitive Detection of Pesticides in Water
Elizaveta Vereshchagina, Karolina Milenko, Firehun Tsige Dullo
SINTEF Digital, Norway

10:30 - 12:00
C1L-08: Sensor Data Processing & AI: Localization and Navigation Sensors
Room: Park Suite 8
Session Chair(s): Marco Da Silva, *Johannes Kepler University Linz*

10:30
INVITED
1924: A Portfolio of Machine Learning-Based GNSS LOS/NLOS Classification in Urban Environments
Ni Zhu, Chaimae Belemoualem, Valérie Renaudin
Université Gustave Eiffel, France

11:00
1124: Using Machine Learning for Target Detection and Matching in Dual Drone-Based Target Localization
Junyu Wei{3}, Shaojing Su{3}, Zongqing Zhao{3}, Zhen Zuo{3}, Xiaoyong Sun{3}, Jiangyi Qin{1}, Tao Ou{2}
{1}Academy of Military Sciences, China; {2}Hunan University, China; {3}National University of Defense Technology, China

11:15
1385: SSL-VoxPart: A Novel Solid-State LiDAR-Tailored Voxel Partition Approach for 3D Perception
Nico Leuze, Henry Schaub, Maximilian Hoh, Alfred Schöttl
University of Applied Science Munich, Germany

11:30
1541: LiDAR-Based Occupancy Grid Map Estimation Exploiting Spatial Sparsity
Ça?an Önen{2}, Ashish Pandharipande{2}, Geethu Joseph{1}, Nitin Myers{1}
{1}Delft University of Technology, Netherlands; {2}NXP Semiconductors, Netherlands

11:45
1023: Improved Multi-Path Interference Separation for Indirect 3D Time-of-Flight Using Particle Swarm Optimization
Matthias Ludwig, Jonas Gutknecht, Teddy Loeliger
ZHAW Zürich University of Applied Sciences, Switzerland

10:30 - 12:00
C1L-09: Chemical, Electrochemical and Gas Sensors - 2
Room: Park Suite 9
Session Chair(s): Hamida Hallil Abbas, *Bordeaux University*
Xiaoshan Zhu, *Universityof Nevada Reno*

10:30
1630: Cube-Shaped Inorganic Perovskite Bismuth Ferrite Nanostructures as Highly Efficient Hydrogen Gas Sensors
Abhijit Eshore, Bidesh Mahata, Dipak Goswami, Prasanta Kumar Guha
Indian Institute of Technology Kharagpur, India

10:45
1618: E-Nose System Based on Ultra-Low Power Single Micro-LED Gas Sensor and Deep Learning
Kichul Lee{1}, Incheol Cho{2}, Inkyu Park{1}
{1}Korea Advanced Institute of Science and Technology, Korea; {2}Samsung Electronics Co., Ltd., Korea

11:00
1579: Development of an Impedance Analyser with Complex Capacitance for Biosensing Applications
Taskeen Ebrahim, Willem Perold, Anna-Mart Engelbrecht
Stellenbosch University, South Africa

11:15
1071: Electrochemical Biosensor for Timely Detection of Lactococcus Lactis Bacteriophage in Milk Samples
Stefano Bonaldo{2}, Lara Franchin{2}, Erica Cretaio{1}, Elisabetta Pasqualotto{1}, Matteo Scaramuzza{1}, Alessandro Paccagnella{2}
{1}ARC – Centro Ricerche Applicate s.r.l., Italy; {2}Università degli Studi di Padova, Italy

11:30
1501: ZnCr2-xFexO4 Nanoparticles-Modified Electrochemical Sensors: A Comparative Study
Mallikarjun Madagalam{3}, Mattia Bartoli{1}, Sandro Carrara{2}, Alberto Tagliaferro{3}
{1}Center for Sustainable Future Technologies CSFT, Politecnico di Torino, Italy; {2}École Polytechnique Fédérale de Lausanne, Switzerland; {3}Politecnico di Torino, Italy

11:45
1422: Gas Sensor Based on Nonlinear Coupled AlN-Piezoelectric Micromachined Resonators
Zhengliang Fang{2}, Stephanos Theodossiades{2}, Nizar Jaber{1}, Amal Hajjej-Ep-Zemni{2}
{1}King Fahd University of Petroleum and Minerals, Saudi Arabia; {2}Wolfson School of Mechanical, Electrical and Manufacturing Engineering, Loughborough University, United Kingdom

12:00 - 13:30
Lunch
Room: Restaurant LENZ & Selleny´s Bar

13:30 - 15:00
WiSe/YP Big Idea Pitch Competition
Room: Park Suite 9
Session Chair(s): Shawana Tabassum, *The University of Texas at Tyler*

13:30 - 15:00
C2P-10: Sensor Phenomenology, Modeling and Evaluation - B
Room: Grand Klimt Hall
Session Chair(s): Massood Atashbar, *Western Michigan University*

1020: Real-Time Resonance Frequency Tracking in Photoacoustic Spectroscopy for Gas Detection
Danyang Ren, Yuqi Wang, Shaobo Wang, Junhui Shi, Yonggang Yin
Zhejiang Lab, China

1282: A Simple and Low-Cost Technique to Measure the Magnetic Susceptibility of Ferrofluids
Angelika Thalmayer{1}, Keyu Xiao{1}, Maximilian Lübke{1}, Dmitry Borin{2}, Stefan Odenbach{2}, Harald Unterweger{3}, Klaus Helmreich{1}, Georg Fischer{1}
{1}Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; {2}Technische Universität Dresden, Germany; {3}Universitätsklinikum Erlangen, Germany

1569: Increasing Sensitivity of Magnetic Tactile Sensors by Optimizing Arrangement of PM Array
Yen-Ping Lin{1}, Kai-Yang Peng{1}, Jen-Yuan Chang{2}
{1}National Tsing Hua University, Taiwan; {2}National Tsing Hua University, National Formosa University, Taiwan

1627: Effects of Various Head Movement Executions on Spatial Accuracy of Magnetoencephalography Systems
Mevlüt Yalaz{2}, Markus Butz{1}, Günther Deuschl{3}, Patrick Boe{2}, Ann-Kristin Helmers{3}, Alfons Schnitzler{1}, Michael Höft{2}
{1}Heinrich Heine University Düsseldorf, Germany; {2}Kiel University, Germany; {3}University Hospital Schleswig-Holstein, Germany

1652: Making a Microwave Sandwich from Tunable Impedance Sheets for Complex Permittivity Extraction
Ali Maleki Gargari, Omran Abbas, Loic Markley
University of British Columbia, Canada

1696: Increasing Sensitivity of Mass Detection Using Nonlinear Micro/Nano-Mechanical Resonators
Old?ich Ševe?ek{1}, Petr Skalka{1}, Ji?í Venský{1}, Michal Kotoul{1}, Jan Prášek{2}, Ivo Stachiv{3}
{1}Brno University of Technology, Czech Rep.; {2}CEITEC, Brno University of Technology, Czech Rep.; {3}Institute of Physics, Czech Academy of Sciences, Czech Rep.

13:30 - 15:00
C2P-11: Sensor Materials, Fabrication and Packaging - B
Room: Grand Klimt Hall
Session Chair(s): Ulrich Schmid, *TU Wien*

1367: Development of ZnO NRs-rGO Low-Impedance Electrodes for Astrocyte Cell Signal Recording
José Ignacio Del Río De Vicente{3}, Ivano Lucarini{3}, Francesco Maita{3}, Davide Salvò{1}, Valeria Marchetti{2}, Miroslava Anderova{2}, Julio Gómez{1}, Luca Maiolo{3}
{1}Avanzare Innovación Tecnológica S.L, Spain; {2}Institute of Experimental Medicine, Academy of Sciences of the Czech Republic, Czech Rep.; {3}Istituto per la Microelettronica e i Microsistemi IMM-CNR, Italy

1368: Enhancing Anti-Icing Performance of Sensors with Thermoresponsive-Superhydrophobic Hybrid Surfaces
Hyeonho Lee, Jung Bin Yang, Dong Rip Kim
Hanyang University, Korea

1687: Fabrication of Microtip Electrode Array with Varying Heights for Electrical Measurement of Neural Cells
Kyeong-Taek Nam{2}, Yong-Kweon Kim{2}, Seung-Ki Lee{1}, Jae-Hyoung Park{1}
{1}Dankook University, Korea; {2}Seoul National University, Korea

1717: Rapid Detection of Escherichia coli Using Graphene Oxide Based Electrochemical Sensor Chip
Vandana Kumari Chalka, Nikhil Vadera, Khushi Maheshwari, Meenu Chhabra, Kamaljit Rangra, Saakshi Dhanekar
Indian Institute of Technology Jodhpur, India

1746: Room Temperature Ammonia Gas Sensing Using Polyaniline/Indium Oxide/Onion-Like Carbon Composite
Boipelo Mathe, Clinton Masemola, John Moma, Zikhona Tetana, Ella Linganiso
University of the Witwatersrand, South Africa

1788: Metglas Based Multi-Modal Sensing Employing Magnetostrictive and Triboelectric Properties
Dibyajyoti Mukherjee, Sourav Naval, Nadeem Tariq Beigh, Dhiman Mallick
Indian Institute of Technology Delhi, India

13:30 - 15:00
C2P-12: Chemical, Electrochemical and Gas Sensors - B
Room: Grand Klimt Hall
Session Chair(s): Hamida Hallil Abbas, *Bordeaux University*
Xiaoshan Zhu, *Universityof Nevada Reno*

1436: Plant Disease Detection Using an Electronic Nose
Erdem Sennik{2}, Samuel Kinoshita-Millard{1}, Yeonyee Oh{2}, Christopher W. Kafer{1}, Ralph A. Dean{2}, Ömer Oralkan{2}
{1}BASF SE, United States; {2}North Carolina State University, United States

1515: Development of a Micro Gas Sensor with a Suspended Micro Heater for Methyl Mercaptan Gas Detection
Chia-Hsu Hsieh, Chuan-Chun Liu, Yao-Ching Fang, Ya-Han Lin, Chun-Hsun Lin, I-Yu Huang
National Sun Yat-sen University, Taiwan

1529: Reduced SnO_{2-x} for Low Power NO_2 Gas Sensors: From First Principles Simulations to Sensing Performance
Soufiane Krik{2}, Barbara Fabbri{4}, Matteo Valt{3}, Elena Spagnoli{4}, Manuela Ciocca{2}, Davide Casotti{1}, Michele Della Ciana{4}, Lia Vanzetti{3}, Antonio Orlando{2}, Luisa Petti{2}, Andrea Gaiardo{3}, Vincenzo Guidi{4}
{1}CNR-NANO, Institute of Nanoscience, National Research Council, Italy; {2}Free University of Bozen-Bolzano, Italy; {3}MNF, Sensors and Devices Center, Bruno Kessler Foundation, Italy; {4}Università degli Studi di Ferrara, Italy

1624: High Performance Isopropanol Sensor Employing Hierarchical WO3 Microflowers
Bidesh Mahata, Snehanjan Acharyya, Abhijit Eshore, Pallab Banerji, Prasanta Kumar Guha
Indian Institute of Technology Kharagpur, India

1626: Rapid and Cost-Effective Fabrication of Biosensors for Salmonella Detection
Ivana Kundacina{1}, Manil Kukkar{1}, Ivan Nastasijevic{2}, Sasa Jankovic{2}, Radmila Mitrovic{2}, Vasa Radonic{1}
{1}BioSense Institute, Serbia; {2}Institute of Meat Hygiene and Technology, Serbia

1644: MOS Sensors Characterizing Gas Absorption Dynamics for Art Conservation
Oliver Brieger{1}, My Sa Marschibois{1}, Gerhard Eggert{2}, Andreas Schütze{1}, Christian Bur{1}
{1}Saarland University, Germany; {2}State Academy of Art and Design, State Academy of Fine Arts Stuttgart , Germany

1659: High-Performance DMMP Gas Sensor Using PtO/WS2 Hybrid Nanosheets
Fatima Ezahra Annanouch, Shuja Bashir Malik, Aanchal Alagh, Eduard Llobet
Universitat Rovira i Virgili, Spain

1662: Glucose and Lactate Amperometric Sensors on a Flexible Printed Circuit for Low-Cost Sensing Applications
Panagiotis Kassanos, Sally Gowers, Martyn Boutelle
Imperial College London, United Kingdom

1719: ZIF-67-MWCNT Nanohybrid Based Electrochemical Immunosensing Device for Diagnosing Kidney Dysfunction
Divya Divya, Pranjal Chandra
Indian Institute of Technology BHU Varanasi, India

1837: Real-Time Electrochemical Sensor for Phosphate Sensing in Water
Tarun Narayan{1}, Mary-Kate Reidy{2}, Sarah Heelan{2}, Alan O'Riordan{1}, Han Shao{1}
{1}Tyndall National Institute, Ireland; {2}University College Cork, Ireland

1842: Bio-Based Colorimetric Sensors for Detecting Ammonia in the Air
Jochem Hagenaar, Gennady Oshovsky, Christiaan Tempelman, Matej Majstorovic, Jan Herselman
Rotterdam University of Applied Sciences, Netherlands

1876: Integration of Thin Film Electrodes for Microfluidic Electrochemical Cells
Elizaveta Vereshchagina{2}, Karolina Kolczyk-Siedlecka{1}, Zbigniew Szklarz{1}, Paul Wittendorp{2}, Aina Herbjørnrød{2}, Guido Sordo{2}, Sigurd Moe{2}, Shruti Jain{2}, Anand Summanwar{2}, Do Chi Huong Hoang{2}, Pawel Wojcik{1}
{1}redoxme AB sp. z o.o. Oddzia? w Polsce redox.me, Poland; {2}SINTEF Digital, Norway

1880: Reduced Graphene Oxide-Based Chemiresistive NO2 Sensor: Metal Oxide Nanoparticles Decoration Effect
Atanu Bag, Dong-Bin Moon, Nae-Eung Lee
Sungkyunkwan University, Korea

1886: High Sensitivity pH Sensor Based on Liquid Droplet Motion Over Hydrophobic Polymer
Shalini Shalini, Khanjan M Joshi, Pushpapraj Singh, Dhiman Mallick, Ankur Goswami
Indian Institute of Technology Delhi, India

1978: High-Density Integration of Multiple Independent Temperature-Controlled Micro Hotplates for MEMS Gas Sensors
Zheng Zhang{2}, Liyang Luo{2}, Yuanyuan Luo{3}, Zhaohua Zhang{1}, Chaoyang Xing{1}, Guotao Duan{2}
{1}Beijing Institute of Aerospace Control Devices, China; {2}Huazhong University of Science and Technology, China; {3}Institute of Solid State Physics, China

13:30 - 15:00
C2P-13: Biosensors and Microfluidics - B
Room: Grand Klimt Hall
Session Chair(s): Hyejin Moon, *The University of Texas at Arlington*
Uwe Schnakenberg, *RWTH Aachen University*

1339: Unmanned PCR System for Virus Monitoring Utilizing a Film Chip Roll
Kwang Hyo Chung, Yo Han Choi, Dong Kyu Lee, Chang-Geun Ahn, Yongwon Jang, You Jin Kim
Electronics and Telecommunications Research Institute, Korea

1438: An Android Based Portable Biosensor System for Cardiac Risk-Stratification by Detecting HFABP in Human Plasma
Partha Pratim Goswami, Swati Mohanty, Ullas Pandey, Shiv Govind Singh
Indian Institute of Technology Hyderabad, India

1453: Advancing Transdermal Therapeutics: In-Vivo Assessment and Computational Insights Into Porous Microneedle-Based Drug Delivery
Esraa Fakeih, Dana Al Sulaiman, Khaled Nabil Salama
King Abdullah University of Science and Technology, Saudi Arabia

1607: Electrochemical Biosensing of Myeloperoxidase in Undiluted Serum on Screen Printed Electrodes Using PEG Coated Hierarchical Gold Nanostructures
Anju Joshi, Ruchira Nandeshwar, Siddharth Tallur
Indian Institute of Technology Bombay, India

1643: Amperometric Urine Biosensor for Rapid Point-of-Care Tuberculosis Diagnosis
Camille Delgrange{1}, Alessandro Fulciniti{1}, Tolga Veske{1}, Romain Peseux{1}, Amar Kapic{1}, Ata Golparvar{2}, Gian Luca Barbruni{1}, Sandro Carrara{1}
{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}Sabanci University, École Polytechnique Fédérale de Lausanne, Switzerland

1684: Two-Dimensional Passive Type Micro Mixer Using Dean Flow and Asymmetric Channel Structure
Young-Ho Nam, Seung-Ki Lee, Jae-Hyoung Park
Dankook University, Korea

1765: Dielectrophoretic Particle Focusing Using Axisymmetric Quadric Electrodes
Negar Danesh, Vatsal Asitkumar Joshi, Alan Bowling, Michael Cho, Hyejin Moon
University of Texas at Arlington, United States

1795: Multimodal Biosensor System for Exhaled Breath Based Lung Cancer Diagnosis
Junyeong Lee{1}, Young Wung Kim{3}, Kyoung G. Lee{2}, Nam Ho Bae{2}, Daekyeong Jung{2}, Dae-Sik Lee{1}
{1}Electronics and Telecommunications Research Institute, Korea; {2}National NanoFab Center, Korea; {3}WENS, Naver, Korea

1811: Graphene Biosensors Operated in DC Transistor and AC Electrochemical Modes for DNA Sensing
Edgar PinzÓn{1}, Telma Domingues{1}, Rodrigo Wrege{1}, Laís Lopes{2}, Jérôme Borme{1}, Thiago DarÓs{1}, João Piteira{1}, Bruno Costa{3}, Paulo Bueno{2}, Pedro Alpuim{1}
{1}International Iberian Nanotechnology Laboratory, Portugal; {2}São Paulo State University, Brazil; {3}Universidade do Minho, Portugal

1864: A Predictive Point-of-Care Platform for Early Detection of Periodontal Disease
Dafydd Ravenscroft, Luigi G. Occhipinti
University of Cambridge, United Kingdom

1923: Biological Sensor Based on Silicon Nanowires for Electrical Detection of Staphylococcus Aureus Bacteria
Anne-Claire Salaün, Laurent Pichon, Yousra Benserhir, Anne Jolivet-Gougeon, Nolwenn Oliviero, Florence Geneste, Rafika Selmi
Université de Rennes, France

13:30 - 15:00
C2P-14: Optical Sensors - B
Room: Grand Klimt Hall
Session Chair(s): Karsten Fehse, *Fraunhofer Institute for Electron Beam and Plasma Technology FEP*

1383: Basic Characteristics of Optical Probe Current Sensor and Current Measurement Flowing Through Bonding Wire of SiC Power Devices
Satoshi Sue{1}, Mitsunori Miyamoto{1}, Toshiya Kubo{1}, Makoto Sonehara{2}, Toshiro Sato{2}
{1}CITIZEN FINEDEVICE CO.,LTD., Japan; {2}Shinshu University, Japan

1467: Comparing Sensitivity of Methods to Measure Acoustic Vibrations in Optical Fibers
Martin Cizek{2}, Ondrej Cip{2}, Ondrej Mokry{1}, Petr Dejdar{1}, Petr Munster{1}, Tomas Horvath{1}
{1}Brno University of Technology, Czech Rep.; {2}Institute of Scientific Instruments of the CAS, v. v. i., Czech Rep.

1468: Luminescence Spectroscopy of Mechanically Processed Lithium-Ion Battery Cells
Roman Tschagaew{3}, Christian Röder{1}, Alexandra Kaas{2}, Johannes Heitmann{1}
{1}IAP, Technische Universität Bergakademie Freiberg, Germany; {2}MVTAT, Technische Universität Bergakademie Freiberg, Germany; {3}Technische Universität Bergakademie Freiberg, Germany

1540: Fabrication of Nanostructures on Optical Fibers Using Nanosphere Lithography for Biosensing
Hyeong-Min Kim, Young-Ho Nam, Seung-Chul Yang, Jae-Hyoung Park, Seung-Ki Lee
Dankook University, Korea

1550: Molecular Imprinted Polymer on Optical Fiber Sensor for Ethanol Vapor Biomarker Detection
Pannathorn Jitpratak{1}, Akhilesh Kumar Pathak{2}, Kankan Swargiary{1}, Charusluk Viphavakit{1}
{1}Chulalongkorn University, Thailand; {2}Northwestern University, United States

1606: Seismic Monitoring of High-Rise Buildings Based on Fiber Optic Jerk Sensor
Zhoutao Sun{2}, Jie Yi{3}, Yuntian Teng{1}, Wenzhu Huang{2}, Bin Zhao{3}, Fang Li{2}, Wentao Zhang{2}
{1}Institute of Geophysics, China Earthquake Administration, China; {2}Institute of Semiconductors, Chinese Academy of Sciences, China; {3}Tongji University, China

1634: Towards Photon-Noise Limited Thermal IR Detection with Optomechanical Resonators
Paolo Martini, Kostas Kanellopulos, Silvan Schmid
Technische Universität Wien, Austria

1813: Application of TiO2 Based Wide Bandgap Semiconductor to Intense Proton Beam Monitoring
Pankaj Chetry{3}, Rupa Jeena{3}, Amandeep Kaur{3}, Pradeep Sarin{3}, Elizabeth George{3}, Kou Oishi{2}, Yoshinori Hashimoto{1}, Yoshinori Fukao{1}, Satoshi Mihara{1}
{1}High Energy Accelerator Research Organization KEK, Japan; {2}Imperial College London, United Kingdom; {3}Indian Institute of Technology Bombay, India

1826: Micropower Active Optical Position Sensor for Decimeter-Range Sensing Gaps
Eduard Burian
LOX Technologies s.r.o., Slovakia

1858: A Stand-Alone Polarimetric Acquisition System for Producing a Long-Term Skylight Dataset
Leo Poughon{2}, Vincent Aubry{4}, Jocelyn Monnoyer{4}, Stéphane Viollet{3}, Julien R. Serres{1}
{1}Etienne-Jules MAREY Institute of Movement Sciences, Aix Marseille Université, France; {2}Institut des Sciences du Mouvement, France; {3}Institut des Sciences du Mouvement, Aix Marseille Université, France; {4}Stellantis N.V., France

1899: Optical Fiber Coiled Sensors for Acoustic Oblique Wave Detection Using Distributed Acoustic Sensing
Frederico Jahnert{2}, Beatriz Brusamarello{3}, Danilo Fernandes Gomes{3}, Sérgio Taveira de Camargo Júnior{1}, Manoel Feliciano Da Silva{1}, Jean Carlos Cardozo Da Silva{3}, Cicero Martelli{3}, Jucélio Pereira{2}, Carlos Bavastri{2}
{1}Petrobras Research and Development Program, Brazil; {2}Universidade Federal do Paraná, Brazil; {3}Universidade Tecnológica Federal do Paraná, Brazil

2122: Measurement of Fluid Flow Velocity by Using Infrared and Visual Cameras: Comparison and Evaluation of Optical Flow Estimation Algorithms
Zhe Shen, Robert Schmoll, Andreas Kroll
Universität Kassel, Germany

13:30 - 15:00
C2P-15: Physical Sensors - B
Room: Grand Klimt Hall
Session Chair(s): Massood Tabib-Azar, *University of Utah*
Siavash Pourkamali, *University of Texas at Dallas*

142: High Temperature Characteristics of Piezoresistive Silicon Carbide Pressure Sensors Implemented by Leadless Packaging
Lukang Wang, You Zhao, Yu Yang, Yabing Wang, Yulong Zhao
Xi'an Jiaotong University, China

1477: Miniaturized Magnetoelectric Antenna for Low Frequency Electromagnetic Wave Communication
Yuanhang Wang{1}, Tao Wang{2}, Yinan Wang{1}, Honglong Chang{1}, Jiayan Wang{1}, Qi Xi{1}, Guohao Zi{1}, Ziqiang Jia{1}, Shanlin Zhao{1}, Dishu Huang{1}, Zhibo Ma{1}
{1}Ministry of Education Key Lab of Micro/Nano Systems for Aerospace, Northwestern Polytechnical, China; {2}Ning'bo Research Institute of Northwestern Polytechnic University, China

1539: A Sphrical Waterflow Vector Sensor in Deep Sea
Takuto Kishimoto{1}, Kenei Matsudaira{1}, Hiroto Tanaka{2}, Hidetoshi Takahashi{1}
{1}Keio University, Japan; {2}Tokyo Institute of Technology, Japan

1547: A CMOS-MEMS Pressure Sensor with Integrated Front-End for Chemical Vapor Deposition Systems
Tsung-Heng Tsai{2}, Song-You Hong{1}
{1}National Chung Cheng University, Taiwan; {2}National Yang Ming Chiao Tung University, Taiwan

1609: Wireless, Battery-Free, Multi-Modal Sensor System for Continuous Monitoring of Physiological Signals of Paraplegic Patients
Seokjoo Cho{2}, Hyeonseok Han{2}, Yong Suk Oh{1}, Inkyu Park{2}
{1}Changwon University, Korea; {2}Korea Advanced Institute of Science and Technology, Korea

1613: Initial Investigation of Physically Tightly-Coupled Single-Chip MEMS IMU for Mutual Compensation of Two Differential Resonant Accelerometers and a Mode-Matched Donut-Mass Gyroscope
Fumito Miyazaki{1}, Daiki Ono{1}, Jumpei Ogawa{1}, Tazuko Tomioka{1}, Kei Masunishi{2}, Kengo Uchida{1}, Hideaki Murase{1}, Etsuji Ogawa{1}, Fumitaka Ishibashi{1}, Yasushi Tomizawa{1}
{1}Toshiba Corporation, Japan; {2}Toshiba Corporation, Corporate Resarch & Development Center, Japan

1753: Novel Rotary Encoder with Multi-Axis Hall Sensors
Christian Schott, Bruno Brajon, Gaël Close
Melexis Technologies SA, Switzerland

1756: Magnetometry Package for LVICE2 Mission - Triaxial Fluxgate and Amr Magnetometer for Scientific Data Production Near Moon
Vojt?ch Petrucha, David Novotný, Kajetán Šobíšek
Czech Technical University in Prague, Czech Rep.

1799: Neural Network-Assisted Capacitive Sensor for Multi-Directional Force Detection
Mengxin Zhou, Xiyue Cui, Yuanyuan Yang
Xiamen University, China

1828: Determining Vegetable Oil Composition via Spectral Analysis of Faraday Rotation
Ruben Piepgras, Marco Jose Da Silva
Johannes Kepler Universität Linz, Austria

1855: Printed Flexible Polystyrene-Based Temperature Sensor with High Chemical and Mechanical Stabilities
Ahmad Al Shboul, Ricardo Izquierdo
École de Technologie Supérieure, Canada

1884: Fabrication of Structural-Color Based Force Sensor with Biocompatibility for Endoscopic Surgery
Yusaku Maeda{2}, Masato Sagara{3}, Hidekuni Takao{1}
{1}Kagawa University, Japan; {2}Kagawa University, National Institute of Technology KOSEN, Kagawa College, Japan; {3}National Institute of Technology, Kagawa College, Japan

1885: TiN-C Based CMOS MEMS Pirani Gauge for On-Chip Pressure Measurement
Manu Garg{2}, Fang-Wei Tsai{3}, Khanjan M Joshi{1}, Yi Chiu{3}, Pushpapraj Singh{1}
{1}Indian Institute of Technology Delhi, India; {2}Indian Institute of Technology Delhi, National Yang Ming Chiao Tung University, India; {3}National Yang Ming Chiao Tung University, Taiwan

1887: Force-Sensing Intelligent Vise for Cutting Dynamics Monitoring in Machining
Po-Han Chen{1}, Tay-Jyi Lin{2}, Chingwei Yeh{2}, Pei-Zen Chang{1}, Wei-Chang Li{1}
{1}Institute of Applied Mechanics, National Taiwan University, Taiwan; {2}SoC Research Center, National Chung Cheng University, Taiwan

1896: Resonance Frequency and Vibration Mode Modification of Piezoelectric MEMS Ultrasonic Sensors on Buckled Diaphragm Structures for High Sensitivity and High Resolution Measurement
Kaoru Yamashita, Junpei Yamamoto, Zhengxin Yi
Kyoto Institute of Technology, Japan

1897: Plural Kalman Filter-Based Algorithm for Suppressing Strong Magnetic Disturbance in Automotive Steering Angle Sensors
Hyunjun Cha{1}, Yegyun Oh{1}, Hobeom Han{1}, Sang Won Yoon{2}
{1}Hanyang University, Korea; {2}Seoul National University, Korea

1934: Magnetic Domain Transition of Clustered Soft Magnetic Narrow Strips Caused by a Magnetic Small Particle
Tomoo Nakai
Industrial Technology Institute, Miyagi Prefectural Government, Japan

13:30 - 15:00
C2P-16: Acoustic and Ultrasonic Sensors - B
Room: Grand Klimt Hall
Session Chair(s): Haifeng Zhang, *University of North Texas*
Hongyu YU, *Hong Kong University of Science and Technology*

1181: Additive Manufacturing of an Insect Bio-Inspired Hair Acoustic Sensor
Samuele Martinelli, Andrew Reid, Roger Domingo-Roca, James Windmill
University of Strathclyde, United Kingdom

1433: Exploration of Ultrasonic Guided Wave Resonance Technique for Damage Localization
Supriya Gain, Subhadeep Basu, Arijit Sinharay
TATA Consultancy Services Limited , India

1530: Detection of Viral Particles Using a 182 MHz Surface Acoustic Wave Sensor
Olivia Thu Lam, Massood Tabib-Azar
University of Utah, United States

1600: MIP Functionalized Love Wave Sensor for Detection of 4-AP Organic Compound in Turbid Solutions
Asawari Choudhari{3}, Thomas Vignol{2}, Jean-Luc Lachaud{1}, Maxence Rube{3}, Idris Sadli{3}, Martine Sebeloue{3}, Raphaël Delépée{2}, Ollivier Tamarin{3}, Corinne Dejous{1}
{1}Universite de Bordeaux, France; {2}Universite de Caen, France; {3}Universite de Guyane, France

13:30 - 15:00
C2P-17: Sensor Networks and IOT - B
Room: Grand Klimt Hall
Session Chair(s): Domenico Balsamo, *Newcastle University*
Yacine GHAMRI-DOUDANE, *La Rochelle University*

1240: Ultra-Low Power MEMS Inertial Switch Based Wake-Up Wireless Sensing Node for Door Lock Monitoring
Sagnik Ghosh{2}, Duan Jian Goh{2}, Zhongshi Hu{2}, Jaibir Sharma{2}, Yong Shun Teo{2}, Marlon McCarthy{2}, Prakasha Chigahalli Ramegowda{2}, Wei Da Toh{2}, Weiguo Chen{2}, Arulchozhan Murugan{2}, Yao Zhang{2}, Yoshishige Tsuchiya{3}, Amit Lal{1}, Joshua En-Yuan Lee{2}, Yul Koh{2}
{1}Cornell University, United States; {2}Institute of Microelectronics, Agency for Science, Technology and Research, Singapore; {3}University of Southampton, United Kingdom

1290: Wave Profile and Tide Monitoring System for Scalable Implementation
João Rocha, Tiago Matos, Carlos Faria, Camila M. Penso, Marcos Martins, Pedro Gomes, Luís M. Gonçalves
Universidade do Minho, Portugal

1308: Wide-Band Low-Noise Amplifier for Reliable Wireless Sensor Networks
Sarah Ouerghemmi{2}, Ilef Ketata{2}, Ahmed Fakhfakh{1}, Faouzi Derbel{2}
{1}Laboratory of Signals, Systems, Artificial Intelligence and Networks, Tunisia; {2}Leipzig University of Applied Sciences, Germany

1789: Evaluation of a Non-Coherent Ultra-Wideband Transceiver for Micropower Sensor Nodes
Jonah Imfeld, Silvano Cortesi, Philipp Mayer, Michele Magno
ETH Zürich, Switzerland

13:30 - 15:00
C2P-18: Emerginging Sensors in Environmental Applcations - A
Room: Grand Klimt Hall
Session Chair(s): Joost Lötters, *University of Twente*

1369: Ice Sensing Using Combined Capacitive and Impedance Spectroscopic Measurements
Markus Neumayer, Thomas Bretterklieber
Technische Universität Graz, Austria

1451: SNATCH: Stealing Neural Network Architecture from ML Accelerator in Intelligent Sensors
Sudarshan Sharma, Uday Kamal, Jianming Tong, Tushar Krishna, Saibal Mukhopadhyay
Georgia Institute of Technology, United States

1478: Graphene/TiO2 Nanocomposite Based Electrochemical Biosensor Enhanced by Support Vector Machine Classification Model to Detect Different DENV Serotype IgG
Tan Shi Hui, Desmond Teo Kai Xiang, Hwei-San Loh, Tomas Maul, Michelle Tien Tien Tan
University of Nottingham Malaysia, Malaysia

1491: Ultraviolet vs. Visible Skylight Polarization Measurements
Antoine Moutenet{1}, Julien R. Serres{2}, Stéphane Viollet{3}
{1}Aix Marseille Université, France; {2}Etienne-Jules MAREY Institute of Movement Sciences, Aix Marseille Université, France; {3}Institut des Sciences du Mouvement, Aix Marseille Université, France

1763: Design and Characterization of a Data Converter in a SiC CMOS Technology for Harsh Environment Sensing Applications
Yunfan Niu{1}, Jiarui Mo{1}, Alexander May{2}, Mathias Rommel{2}, Chiara Rossi{2}, Joost Romijn{1}, Guoqi Zhang{1}, Sten Vollebregt{1}
{1}Delft University of Technology, Netherlands; {2}Fraunhofer Institute for Integrated Systems and Device Technology IISB, Germany

1786: CMOS MEMS Resonator for Physical Reservoir Computing
Yi Chiu{2}, Fang-Wei Tsai{2}, Liang-Kai Wang{2}, Yuan-Chieh Lee{2}, Manu Garg{1}, Hao-Chiao Hong{2}
{1}Indian Institute of Technology Delhi, National Yang Ming Chiao Tung University, Taiwan; {2}National Yang Ming Chiao Tung University, Taiwan

1803: Soil Water Content Sensor in the IoT Precision Agriculture
Pisana Placidi, Carmine Villani Delle Vergini, Nicola Papini, Elia Ciancabilla, Manuela Cecconi, Andrea Scorzoni
Università degli Studi di Perugia, Italy

1930: Biodegradable Humidity Sensor Based on Laser Induced Graphene Electrodes Scribed on Wood
Lukas Neumaier, Johanna Zikulnig, Sabine Lengger, Jürgen Kosel
Silicon Austria Labs GmbH, Austria

13:30 - 15:00
C2P-19: Sensor Systems - B
Room: Grand Klimt Hall
Session Chair(s): Chang-hee Won, *Temple University*

1051: Breast Cancer Risk Estimation Using Patient Health Information and Tactile Sensing System
Sung Choi{1}, Dina Caroline{2}, Chang-Hee Won{1}
{1}Temple University, United States; {2}Temple University Hospital, United States

1060: An Innovative Approach to Improve Diagnostic of Arterial Stenosis Using Phonoangiography Signal
Abdelouahad Achmamad{1}, Taoufik M'Hammedi{1}, Nourdin Yaakoubi{1}, Abdelhamid Errachid{3}, Mohamed El Fezazi{2}, Atman Jbari{2}, Larbi Bellarbi{2}
{1}Le Mans Universite, France; {2}Mohammed V University, Morocco; {3}Université de Lyon, France

1149: Deep Nose Project: A Study of Multidimensional Multimodal Olfactory Intelligence System for Ultra-Trace Gas Component Detection
Yongwon Jang, Hyung Wook Noh, Hwin Dol Park, Kwang Hyo Chung, Chang-Geun Ahn
Electronics and Telecommunications Research Institute, Korea

1409: 1D CNN-LSTM Based Electronic Nose Algorithm for Disinfectant Concentration Detection
Xiaoyu Liu, Guangfen Wei, Aixiang He, Wei Zhang, Shasha Jiao
Shandong Technology and Business University, China

1415: A Continuous Smart Abdominal Fetal Heart Rate Monitor Using Photoplethysmography
Sangeetha B, Manivannan M
Indian Institute of Technology Madras, India

1475: Utilization of Artifact and Noise Affected Electrocardiogram for Simultaneous Heart Rate Computation and Motion Type Inference
Jihwan Kim{2}, Hyun Bin Kim{2}, Dengyang Lu{3}, Byeong Woon Lee{2}, Wooseok Kim{2}, Sang Uk Park{2}, Hee Kyu Lee{2}, Jaejun Lim{2}, Yida Wang{3}, Seunghwan Seo{1}, Sang Min Won{2}
{1}Research Laboratory of Electronics, Massachusetts Institute of Technology, United States; {2}Sungkyunkwan University, Korea; {3}University of Pennsylvania, United States

1590: Human-Inspired Stretch and Joint-Bend Sensing System Based on Flexible Sensors
Shashank Mishra{2}, Dina Anna John{2}, Naveen Kumar{2}, Beena Rai{1}, Vihar Georgiev{2}
{1}TATA Consultancy Services Limited , India; {2}University of Glasgow, United Kingdom

1726: Wearable Haptic Sensing - Enriching Accessibility of Pictorial Information for Visually Impaired
Chinmay Sultania, Divyansh Singhal, Soham Pawar, Mayank Kabra, Anshul Madurwar, Madhav Rao
International Institute of Information Technology Bangalore, India

1768: Towards Enhanced Bladder Volume Measurement with Context-Aware Bio-Impedance Sensor Fusion
Kanika Dheman{1}, Manuel Glahn{2}, Michele Magno{2}
{1}Center for Project Based Learning, ETH Zürich, Switzerland; {2}ETH Zürich, Switzerland

1816: Evaluating Orthostatic Responses with Wearable Chest-Based Photoplethysmography in Patients with Parkinson's Disease
John Berkebile{2}, Omer Inan{2}, Paul Beach{1}
{1}Emory University School of Medicine, United States; {2}Georgia Institute of Technology, United States

1838: Magnetically Triggered Imaging System for Automated Validation of Magnetic Flow Cytometry Observations
Ruben Afonso{3}, Diogo Miguel Bárbara Caetano{2}, Ana Rita Soares{1}, Moisés Piedade{4}, Gonçalo Nuno Tavares{4}, Susana Cardoso{2}
{1}INESC MN, Portugal; {2}INESC MN, Instituto Superior Técnico, Universidade de Lisboa, Portugal; {3}INESC-ID, INESC MN, Instituto Superior Técnico, Universidade de Lisboa, Portugal; {4}INESC-ID, Instituto Superior Técnico, Universidade de Lisboa, Portugal

1868: The First Hand-Held Touch Feeling Measurement System Integrated with Force Sensing Mechanism
Satoshi Hisayasu{1}, Takaya Ohishi{1}, Yusaku Maeda{2}, Kyohei Terao{1}, Fusao Shimokawa{1}, Hidekuni Takao{1}
{1}Kagawa University, Japan; {2}Kagawa University, National Institute of Technology KOSEN, Kagawa College, Japan

1159: AI-EMS: An Environmental Monitoring System with AI Prediction
Chih-Chyau Yang{2}, Chih-Ting Kuo{2}, Ssu-Ying Chen{2}, Hao-Wu Liu{1}, Fu-Chen Cheng{2}, Yi-Jie Hsieh{2}, Jin-Ju Chue{2}, Chien-Ming Wu{2}, Chun-Ming Huang{2}
{1}National Taiwan University of Science and Technology, Taiwan; {2}Taiwan Semiconductor Research Institute, Taiwan

1597: Multi-Node Networked Indoor Air Quality Monitor
Brandon Hippe, Adam Dezay, Manuel Garcia, Mercedes Newton, John Acken, David Burnett
Portland State University, United States

1610: A Multi-Surface Acoustic Wave Sensor Platform for the Detection and Identification of Toxic Gases
Mariem Slimani{2}, Christine Mer-Calfati{1}, Jean-Philippe Poli{1}, Franck Badets{1}, Edwin Friedman{1}, Venceslass Rat{1}, Thierry Laroche{3}, Samuel Saada{1}
{1}CEA, France; {2}CEA-LIST, France; {3}SOITEC, France

1154: Multi-Sensor Low-Noise Modular Magnetic Flow Cytometer for Bacteria Detection
Ruben Afonso{3}, Diogo Miguel Bárbara Caetano{2}, Ricardo Lorena{3}, Ana Rita Soares{1}, Moisés Piedade{4}, Gonçalo Nuno Tavares{4}, Susana Cardoso{2}
{1}INESC MN, Portugal; {2}INESC MN, Instituto Superior Técnico, Universidade de Lisboa, Portugal; {3}INESC-ID, INESC MN, Instituto Superior Técnico, Universidade de Lisboa, Portugal; {4}INESC-ID, Instituto Superior Técnico, Universidade de Lisboa, Portugal

1787: Contact-Less Body Temperature Monitoring by Infrared Camera: Accuracy Preliminary Assessment
Elisabetta Leogrande, Chiara Botrugno, Teresa Natale, Francesco Dell'Olio
Polytechnic University of Bari, Italy

1474: A Map Feature Fusion Based Artifact Removal Method for Non-Contact Vital Sign Detection with a Single FMCW Radar
Yuxiang Qiu, Michitaka Yamamoto, Seiichi Takamatsu, Toshihiro Itoh
University of Tokyo, Japan

1695: A Framework for Seamless Trajectory Estimation and Navigation of Robotic Sensor Platform with Resource-Constrained Embedded Controller
Pankhi Kashyap, Hardik Ghoshal, Siddharth Tallur
Indian Institute of Technology Bombay, India

13:30 - 15:00
C2P-20: Energy Harvesting and Generators
Room: Grand Klimt Hall
Session Chair(s): Hongsoo Choi, *Daegu Gyeongbuk Institute*
Jongmoon Jang, *Korea Institute of Materials Science (KIMS)*

1374: Advancing the Ferroelectric-Based Triboelectric Nanogenerator via Composition Optimization
Manisha Sahu, Sugato Hajra, Hang Gyeom Kim, Il Ryu Jang, Jeonhyeong Park, Aneeta Manjari Padhan, Hoe Joon Kim
Daegu Gyeongbuk Institute of Science and Technology, Korea

1561: Design of a Novel Tridimensional Silicon MEMS Thermoelectric Generator
Alessandro Nastro{2}, Marco Baù{2}, Marco Ferrari{2}, Francesco Foncellino{1}, Flavio Francesco Villa{1}, Federico Cuneo{1}, Federica Capra{1}, Vittorio Ferrari{2}
{1}STMicroelectronics, Italy; {2}Università degli Studi di Brescia, Italy

1867: Development of an Energy Harvesting Tile Using Novel MXene-Cement Based Triboelectric Nanogenerator
Valliammai Palaniappan, Alimohammad Haji Adineh, Dinesh Maddipatla, Bradley Bazuin, Massood Atashbar
Western Michigan University, United States

1872: Development of a Flexible Polyimide-Thermoplastic Polyurethane Based Triboelectric Nanogenerator for Energy Harvesting Applications
Alimohammad Haji Adineh, Valliammai Palaniappan, Dinesh Maddipatla, Simin Masihi, Binu Baby Narakathu, Bradley Bazuin, Massood Atashbar
Western Michigan University, United States

1851: An Electrostatic Micropositioner with 3 Degrees-of-Freedom
Seyedfakhreddin Nabavi, Michaël Ménard, Frederic Nabki
École de Technologie Supérieure, Canada

13:30 - 15:00
C2P-21: Sensor Data Processing & AI - B
Room: Grand Klimt Hall
Session Chair(s): Ni Zhu, *Université Gustave Eiffel*

1087: Combating Sensor Drift with an LSTM Neural Network Enhanced by Autoencoder Preprocessing
Junming Wang, Jing Shu, Zheng Li, Kai-Yu Tong
Chinese University of Hong Kong, Hong Kong

1122: A Robust Multi-Frame mmWave Radar Point Cloud-Based Human Skeleton Estimation Approach with Point Cloud Reliability Assessment
Xintong Shi, Tomoaki Ohtsuki
Keio University, Japan

1153: A Double-Level Interleaved Group Convolutional Network in the Frequency Domain for E-Nose Gas Recognition
Zijian Wang, Mingye Han, Huisheng Zhang, Jia Yan
Southwest University, China

1189: Spatial-Temporal Graph Attention Fuser for Calibration in IoT Air Pollution Monitoring Systems
Keivan Faghih Niresi{1}, Mengjie Zhao{1}, Hugo Bissig{2}, Henri Baumann{2}, Olga Fink{1}
{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}Eidgenössisches Institut für Metrologie METAS, Switzerland

1243: LSTM-Driven Vehicle Counting for Bridge Health Monitoring with a Magnetostrictive Vibration Sensor
Shinji Koganezawa, Futa Matsumoto, Hiroshi Tani, Renguo Lu, Shouhei Kawada
Kansai University, Japan

1420: HFR Video-Based Hornet Detection Approach Using Wing-Beat Frequency Analysis
Junhao Li{1}, Kohei Shimasaki{1}, Abudoureheman Tuniyazi{1}, Idaku Ishii{1}, Mari Ogihara{2}, Mikio Yoshiyama{2}
{1}Hiroshima University, Japan; {2}National Agriculture and Food Research Organization, Japan

1421: A Smart Robotic System for Industrial Plant Supervision
Dulce Adriana Gómez Rosal{1}, Max Bergau{3}, Georg Kurt Johannes Fischer{5}, Andreas Wachaja{2}, Johannes Gräter{2}, Matthias Odenweller{4}, Uwe Piechottka{4}, Fabian Hoeflinger{7}, Nikhil Gosala{1}, Niklas Wetzel{1}, Daniel Büscher{1}, Abhinav Valada{1}, Wolfram Burgard{6}
{1}Albert-Ludwigs-Universität Freiburg, Germany; {2}dotscene GmbH, Germany; {3}Endress-Hauser Process Solutions GmbH, Germany; {4}Evonik Industries AG, Germany; {5}Fraunhofer Institute for High-Speed Dynamics, Ernst-Mach-Institut, EMI, Germany; {6}Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; {7}Telocate GmbH, Germany

1533: Edge Device for Ultraviolet Fluorescence Inspection of Photovoltaic Panels
André Biffe Di Renzo{2}, Carlos Ruiz Zamarreño{1}, Cicero Martelli{2}, Jean Carlos Cardozo Da Silva{2}
{1}Universidad Pública de Navarra, Spain; {2}Universidade Tecnológica Federal do Paraná, Brazil

1612: An Asymmetric Radar-Camera Fusion Framework for Autonomous Driving
Zhiyi Su, Binbin Ming, Wei Hua
Zhejiang Lab, China

165: Energy-Efficient Sensor Platform Using Reliable Analog-to-Feature Extraction
Minah Lee, Sudarshan Sharma, Wei Chun Wang, Saibal Mukhopadhyay
Georgia Institute of Technology, United States

1672: Evaluation of Time-Series Imaging for Visual Analytics and Processing of an Indoor Air Quality Sensors Network
Hugo O. Garcés{2}, Eduardo Espinosa{1}, Mohamed A. Ahmed{3}, Alejandro J. Rojas{2}, Tongwen Chen{4}, Sirish Shah{4}
{1}Universidad Católica de la Santísima Concepción, Chile; {2}Universidad de Concepción, Chile; {3}Universidad Técnica Federico Santa María, Chile; {4}University of Alberta, Canada

1675: Lane Detection and Estimation from Surround View Camera Sensing Systems
Ting Yuan{2}, Wenqi Cao{2}, Shuqi Zhang{2}, Kaipei Yang{3}, Markus Schoen{1}, Bharanidhar Duraisamy{1}
{1}Daimler AG, Germany; {2}Shanghai Jiao Tong University, China; {3}University of Connecticut, United States

1700: R2L-SLAM: Sensor Fusion-Driven SLAM Using mmWave Radar, LiDAR and Deep Neural Networks
Niels Balemans{2}, Lucas Hooft{3}, Philippe Reiter{2}, Ali Anwar{2}, Jan Steckel{1}, Siegfried Mercelis{2}
{1}FTI Cosys-Lab, University of Antwerp, Belgium; {2}IDLab, University of Antwerp, Belgium; {3}University of Antwerp, Belgium

1767: Data Augmentation for Fault Classification of Railway Track Irregularities in Track-Vehicle Scale Model
Euiyoul Kim, Héctor Alberto Fernández-Bobadilla, Xiaoyue Chen
Universität Stuttgart, Germany

1859: Quantifying Uncertainty in Environmental Sensing with Evidential Deep Learning
Simon Mittermaier, Subhankar Patra, Cecilia Carbonelli
Infineon Technologies AG, Germany

1891: Point-Cloud-Based Change Detection for Steep Slope Vineyard Agriculture
Mark Oliver Mints, Nick Theisen, Peer Neubert, Dietrich Paulus
Universität Koblenz, Germany

1585: Dual Contrastive Learning for Self-Supervised ECG Mapping to Emotions and Glucose Levels
Noy Lalzary, Lior Wolf
Tel Aviv University, Israel

13:30 - 15:00
C2P-22: Wearable Sensors and Systems - B
Room: Grand Klimt Hall
Session Chair(s): Sahika Inal, *King Abdullah University of Science and Technology (KAUST)*
Jürgen Kosel, *Silicon Austria Labs (SAL)*

1461: A Cost Effective Smart Insole System for Real Time Gait Analysis
Nikos Antoniou{2}, Antonis Hadjiantonis{1}, Costas Kyriacou{2}, Andreas Konstantinidis{2}
{1}CyRIC, Cyprus; {2}Frederick University, Cyprus

1511: Integrated Skin Microperfusion System for Lactate Concentration Monitoring
Noriko Tsuruoka, Kenta Tsugueda, Yoichi Haga
Tohoku University, Japan

1583: Low Power Flexible MXene-Graphene Oxide Based Heaters for Wearable Clothing
Roopa Jayaramaiah{1}, Shonkho Shuvro{1}, Sourin Das{2}, Saurabh Kumar{3}, Prosenjit Sen{1}
{1}Indian Institute of Science, India; {2}Indian Institute of Science Education and Research, Bhopal, India; {3}National Institute of Pharmaceutical Education and Research, Guwahati, India

1728: An Electrochemical Microneedle Biosensor with Wide Linear Range for Continuous Glucose Monitoring
Md Selim Reza{2}, Hyesu Song{2}, Ye Young Lee{2}, Md Asaduzzaman{2}, Cheolung Cha{1}, Jae Yeong Park{2}
{1}Korea Electronics Technology Institute, Korea; {2}Kwangwoon University, Korea

1802: Breath Rate Sensor AM Integration Concept for E-Textiles
Maximilian Scherf{2}, Pavel Kulha{2}, Georgios Kokkinis{3}, Rudi Heer{3}, Pascal Stark{1}
{1}Inter-Spitzen AG, Switzerland; {2}PROFACTOR GmbH, Austria; {3}Silicon Austria Labs GmbH, Austria

13:30 - 15:00
C2P-23: Robotics
Room: Grand Klimt Hall
Session Chair(s): Thilo Sauter, *TU Wien and Danube University Krems*

Sensors Letters Paper
2039: Active Optical Sensor Micro-Robot Equipped with Multi-DoF Gripper Arm Based on Kinetic Electronics
Riku Otsuka, Shiyi Zhang, Kenshi Hayashi, Fumihiro Sassa
Kyushu University, Japan

Sensors Letters Paper
2103: Smart Foot Based on FBG Integrated in Composite Material and Adaptive Fuzzy Controller
Marcos Dinis Lavarda, Danilo Fernandes Gomes, Talita Paes, Renata Oliveira de Sousa, Uilian José Dreyer, Jean Carlos Cardozo Da Silva, Cicero Martelli
Universidade Tecnológica Federal do Paraná, Brazil

13:30 - 15:00
C2P-24: Live Demonstration of Sensors and Sensing Technologies - B
Room: Grand Klimt Hall
Session Chair(s): Calogero Maria Oddo, *Sant'Anna School of Advanced Studies, Pisa, Italy*
Anna Grazia Mignani, *CNR-Institute of Applied Physics 'Nello Carrara', Florence Italy*

1068: Live Demonstration: Low-Power Flexible Platform for Laser-Scribed Graphene Sensors
José Ilton de Oliveira Filho, Murilo Calil Faleiros, Daísy Camargo Ferreira, Khaled Nabil Salama
King Abdullah University of Science and Technology, Saudi Arabia

1271: Live Demonstration: Mobile Environmental Monitoring System
Yurii Tsyban, Eckaard Le Roux, Aiman Fakieh, José Ilton de Oliveira Filho, Khaled Nabil Salama
King Abdullah University of Science and Technology, South Africa; King Abdullah University of Science and Technology, Egypt; King Abdullah University of Science and Technology, Saudi Arabia; King Abdullah University of Science and Technology, Ukraine; King Abdullah University of Science and Technology, Brazil

1311: Live Demonstration: IoT Based Smart Vertical Farming Framework with Sensor Network and Mobile Application for Real-Time Monitoring
Ankita Awasthi, Astha Rangare, Roshni Kaushik, Jose Immanuel
Indian Institute of Technology Bhilai, India

1354: Live Demonstration: Prevention and Prediction of Biomechanical Risks in Work Environment
Enrico Valli, Gianluca Milani, Lorenzo Rapetti, Dario Sortino, Gianmarco Gatti, Daniele Pucci
Istituto Italiano di Tecnologia, Italy

1559: Live Demonstration: Soft Flexible Capacitive Sensing Arrays for Pressure, Shear, and Proximity
Jian Gao{3}, Kieran Morton{3}, Ryusuke Ishizaki{2}, Fumiya Hamatsu{1}, Takeshi Ohsato{1}, John D.W. Madden{3}
{1}Honda R&D Co., Ltd, Japan; {2}Honda R&D Co., Ltd, Frontier Robotics Honda R&D, Japan; {3}University of British Columbia, Canada

1498: Live Demonstration: AI-Assisted Magnetic Skin Tracker for Speech Recognition
Montserrat Ramirez-De Angel{1}, Abdullah Saud Almansouri{2}, Khaled Nabil Salama{1}
{1}King Abdullah University of Science and Technology, Saudi Arabia; {2}University of Jeddah, Saudi Arabia

1516: Live Demonstration: An AI Driven Multiplexed Diagnostic Platform for Improving Cancer Care
Saif Ahmad, Ama Frimpong, Mireia Crispin-Ortuzar, Nicole Weckman
52 North Health, United Kingdom

13:30 - 15:00
C2P-25: Sensor Technologies for Sustainable Development - A
Room: Grand Klimt Hall
Session Chair(s): Jae-Hyoung Park, *Dankook University, Korea*

1133: A Portable Sensor System for Structural Health Monitoring with Printed Sensors on Biodegradable Substrates
Lukas Rauter{2}, Harald Gietler{3}, Johanna Zikulnig{2}, Mohammed Khalifa{1}, Hubert Zangl{4}, Jürgen Kosel{2}
{1}Kompetenzzentrum Holz GmbH, Austria; {2}Silicon Austria Labs GmbH, Austria; {3}University of Klagenfurt, Austria; {4}University of Klagenfurt, AAU SAL Ubiquitous Sensing Lab, Austria

1321: OSC Based Gas Sensor for Detecting Agriculture Ammonia Water Pollution
Chih-Lu Chiang{3}, Yu-Yu Huang{1}, Te-Yao Liu{4}, Yi-Yu Chen{4}, Hsin-Fei Meng{2}, Li-Yin Chen{4}, Hsiao-Wen Zan{4}
{1}Farm Management Division, Taiwan Agricultural Research Institute, Taiwan; {2}Institute of Physics, National Yang Ming Chiao Tung University, Taiwan; {3}Institute of Pioneer Semiconductor Innovation,National Yang Ming Chiao Tung University, Taiwan; {4}National Yang Ming Chiao Tung University, Taiwan

1424: Polymer-Based Conductometric Sensor for Acidic and Alkaline Vapors for Firefighting and CBRN Disaster Control
Mark Viebrock, Ramón Joachimstaller, Georg S. Duesberg, Tanja Stimpel-Lindner
Universität der Bundeswehr München, Germany

13:30 - 15:00
C2P-26: Bio-Remote Sensing and Integrated Artificial Intelligence Systems - A
Room: Grand Klimt Hall
Session Chair(s): Albert Treytl, *Danube University Krems*
Paul C.-P. Chao, *Independent Researcher / USA*

1225: Significant Improvement in Precision of Real-Time Blood Pressure Prediction Based on Complete Cycles of Measured PPGs
Duc Huy Nguyen, Paul C.-P. Chao
National Yang Ming Chiao Tung University, Taiwan

1459: Implementing a Personalized Model in Edge via FPGA for Non-Invasive Blood Flow Volume Measurement Based on PPG for Security
Hung-Chi Wu, Duc Huy Nguyen, Paul C.-P. Chao
National Yang Ming Chiao Tung University, Taiwan

13:30 - 15:00
C2P-27: Optical Sensors
Room: Grand Klimt Hall
Session Chair(s): Thilo Sauter, *TU Wien and Danube University Krems*

Sensors Letters Paper
2085: Repetition Rate and Gauge Length Impact on DTGS Temperature Reconstruction
Danilo Fernandes Gomes{3}, Guilherme Heim Weber{3}, Eduardo Henrique Dureck{3}, Daniel Rodrigues Pipa{3}, Marco Jose Da Silva{1}, Jean Carlos Cardozo Da Silva{3}, Sérgio Taveira de Camargo Júnior{2}, Manoel Feliciano Da Silva{2}, Cicero Martelli{3}
{1}Johannes Kepler Universität Linz, Austria; {2}Petrobras Research and Development Program, Brazil; {3}Universidade Tecnológica Federal do Paraná, Brazil

Sensors Letters Paper
2124: Extended Characterization of an Optical Sag Sensor for High-Temperature Low-Sag Lines
Himanshi Singh, Grzegorz Fusiek, Pawel Niewczas
University of Strathclyde, United Kingdom

Sensors Letters Paper
2129: Planar Waveguide LMR Based Sensors: Engineering the Depth of Characteristic Curves
Anand Shrivastav{2}, Ignacio Del Villar{3}, Joaquin Ascorbe{1}, Jesus Corres{3}, Ignacio Raúl Matías{3}
{1}Nadetech Innovations, Spain; {2}SRM Institute of Science & Technology, India; {3}Universidad Pública de Navarra, Spain

Sensors Letters Paper
2131: Self-Powered Signal Conditioning Circuit for an HVDC Optical Current Sensor
Alfred Amiolemen, Grzegorz Fusiek, Pawel Niewczas
University of Strathclyde, United Kingdom

Sensors Letters Paper
1944: UV Light Detection with Side Polished CYTOP Fiber
Ada Ayechu{2}, Desiree Santano{2}, Juan David Lopez Vargas{1}, Ignacio Raúl Matías{2}, Ignacio Del Villar{2}
{1}COPPE, Federal University of Rio de Janeiro, Brazil; {2}Universidad Pública de Navarra, Spain

13:30 - 15:00
C2P-28: Physical Sensors and MEMS
Room: Grand Klimt Hall
Session Chair(s): Thilo Sauter, *TU Wien and Danube University Krems*

Sensors Letters Paper
1982: Soft Tactile Sensor with Multimodal Data Processing for Texture Recognition
Uriel Martinez-Hernandez, Tareq Assaf
University of Bath, United Kingdom

Sensors Letters Paper
1998: Performance Evaluation of MEMS Pirani Sensors with Differently Packaged Structures
Lan Zhang, Jian Lu, Yuichi Kurashima, Hideki Takagi
National Institute of Advanced Industrial Science and Technology, Japan

Sensors Letters Paper
2109: SOI Integrated Micromagnets for Mechanical Magnetic Field Detection
Philip Schmitt{2}, Björn Gojdka{1}, Thomas Lisec{1}, Matthias Kroll{2}, Martin Hoffmann{2}
{1}Fraunhofer Institute for Silicon Technology ISIT, Germany; {2}Ruhr-Universität Bochum, Germany

Sensors Letters Paper
2141: The Strong Effect of NiCr Adhesion Layers in Surface Micromachined MEMS Sensors
Tamar Tepper-Faran{1}, Haran Neiberg{1}, Noam Yitzhak{1}, David Elata{2}
{1}RAFAEL Advanced Defense Systems Ltd, Israel; {2}Technion - Israel Institute of Technology, Israel

Sensors Letters Paper
2143: Bistable rotational SOI actuator with a planar tripod compliant suspension
Erez Benjamin{2}, Ronen Maimon{1}, Slava Krylov{2}
{1}RAFAEL Advanced Defense Systems Ltd, Israel; {2}Tel Aviv University, Israel

13:30 - 15:00
C2P-29: Materials and Emerging Technologies
Room: Grand Klimt Hall
Session Chair(s): Thilo Sauter, *TU Wien and Danube University Krems*

Sensors Letters Paper
2137: Investigation of the Coulombic Efficiency and the Superior Differential Capacity Degradation Analysis
Daniel Schürholz, Bernhard Schweighofer, Markus Neumayer, Hannes Wegleiter
Technische Universität Graz, Austria

13:30 - 15:00
C2P-30: Wireless Networks and IoT
Room: Grand Klimt Hall
Session Chair(s): Thilo Sauter, *TU Wien and Danube University Krems*

Sensors Letters Paper
2060: Tactile Light Switch Using Chipless RFID
Abdullah Saud Almansouri
University of Jeddah, Saudi Arabia

Sensors Letters Paper
2113: Applying t-Distributed Stochastic Neighbor Embedding for Improving Fingerprinting-Based Localization System
Getaneh Berie Tarekegn{3}, Li-Chia Tai{3}, Hsin-Piao Lin{1}, Belayneh Abebe Tesfa{1}, Rong-Terng Juang{1}, Hsu Hsu{3}, Kai-Lun Huang Kai-Lun Huang{2}, Kanishk Singh{3}
{1}National Taipei University, Taiwan; {2}National Tsing Hua University, Taiwan; {3}National Yang Ming Chiao Tung University, Taiwan

Sensors Letters Paper
2145: Bragg reflector type shear mode BAW transformer based on c-axis zig-zag ScAlN multilayer for rectifying antenna
Kazutaka Shiraiwa, Takahiko Yanagitani
Waseda University, Japan

15:00 - 16:30
C3L-01: Healthcare: AI and Assistive Technologies
Room: Park Suite 1
Session Chair(s): Kosuke Minami, *National Institute for Materials Science NIMS*
Ata Golparvar, *Sabanci University, École Polytechnique Fédérale de Lausanne*

15:00
Sensors Letters Paper
2119: Tactile Sensing System and Convolutional Neural Network for Mechanical Property Classification
Vira Oleksyuk, Nazia Rahman, Chang-Hee Won
Temple University, United States

15:15

Sensors Letters Paper

2069: Particle Filter Based Diagnosis and Prognosis for Human Hydration States

Guangxing Niu{2}, Sen Bing{1}, Bin Zhang{2}, Jung-Chih Chiao{1}
{1}Southern Methodist University, United States; {2}University of South Carolina, United States

15:30

Sensors Letters Paper

2089: Novel Features Extraction from EEG Signals for Epilepsy Detection Using Machine Learning Model

Vandana Pandya{2}, Urvashi P. Shukla{1}, Amit Mahesh Joshi{2}
{1}Banasthali Vidyapith, India; {2}Malaviya National Institute of Technology, Jaipur, India

15:45

Sensors Letters Paper

2123: Gait Measurement System Utilizing Missing Point Clouds Caused by Feet with Apple Lidar Camera

Mitsuhiro Takahashi{1}, Masaki Takahashi{2}
{1}Graduate School of Science and Technology, Keio University, Japan; {2}Keio University, Japan

16:00

Sensors Letters Paper

2117: A Haptic Feedback System for Spatial Orientation in the Visually Impaired: a Comprehensive Approach

Eldad Holdengreber, Dvir Kleinberg, Roi Yozevitch, Ido Abekasis, Yuval Israel
Ariel University, Israel

16:15

Sensors Letters Paper

2095: Fully Flexible Smart Gloves and Deep Learning Motion Intention Prediction for Ultra-Low Latency VR Interactions

Yang Li{3}, Jiacheng Jiang{3}, Ruoqin Wang{3}, Zanxiang Mao{3}, Lin Fang{3}, Yirui Qi{3}, Junsheng Zhang{1}, Chili Wu{2}, Hongyu Yu{3}
{1}Fok Ying Tung Research Institute, Hong Kong University of Science and Technology, China; {2}Hong Kong Polytechnic University, Hong Kong; {3}Hong Kong University of Science and Technology, Hong Kong

15:00 - 16:30
C3L-02: Environmental Monitoring
Room: Park Suite 2
Session Chair(s): Steffen Kurzhals, *Austrian Institute of Technology GmbH*

15:00
Sensors Letters Paper
2080: Electrochemical Sensors for Lead Ion Detection Using Sodium Alginate Crosslinked with 2-Acrylamido-2-Methyl Propane Sulfonic Acid and Aluminum Microparticles
Pouya Borjian, Mohammadreza Chimerad, Pawan Pathak, Andre Childs, Swaminath Rajaraman, Hyoung Jin Cho
University of Central Florida, United States

15:15
Sensors Letters Paper
1992: Hydrofluoroolefins Leakage Detection by non-Dispersive Infrared Gas Sensor Using InAsSb Light Emitting Diodes and Photodiodes
Hiromi Fujita, Daiki Yasuda, Shinya Ota, Hirotaka Geka, Edson Camargo, Shota Isshiki, Toshiaki Fukunaka, Naohiro Kuze
Asahi Kasei Microdevices Corporation, Japan

15:30
Sensors Letters Paper
284: Enhancing Water Safety in Decentralized Water Reuse Systems with Low-Cost Prussian Blue Amperometric Sensors for Free Chlorine Monitoring
Gaétan Herold{1}, Francesca Rodino{1}, Ata Golparvar{3}, Eva Reynaert{2}, Sandro Carrara{1}
{1}École Polytechnique Fédérale de Lausanne, Switzerland; {2}ETH Zürich, Switzerland; {3}Sabanci University, École Polytechnique Fédérale de Lausanne, Switzerland

15:45
Sensors Letters Paper
232: Circular Sensing of Nitrate Levels in Water with Flexible screen-Printed Sensors on Biodegradable Cellulose Substrate
A K M Sarwar Inam{3}, Md. Najmul Islam{3}, Shah Zayed Riam{3}, Francisco Perez{3}, Christopher Delhom{1}, Noureddine Abidi{2}, Shawana Tabassum{3}
{1}Agricultural Research Service, United States; {2}Texas Tech University, United States; {3}University of Texas at Tyler, United States

16:00
Sensors Letters Paper
2132: 1D-CNN Network Based real-Time Aerosol Particle Classification with single-Particle Mass Spectrometry
Guanzhong Wang{1}, Heinrich Ruser{1}, Julian Schade{1}, Johannes Passig{2}, Thomas Adam{1}, Günther Dollinger{1}, Ralf Zimmermann{3}
{1}Universität der Bundeswehr München, Germany; {2}University of Rostock, Germany; {3}University of Rostock, Helmholtz Zentrum München, Germany

16:15

Sensors Letters Paper

2134: Rapid Detection of Paraquat Pesticide in Honey Using Sers Based Portable Nanosensing Platform

Sarvar Singh{1}, Saira Bano{2}, Sambit K Keshi{3}, Ujjwal Singh{1}, Ajay Agarwal{1}
{1}Indian Institute of Technology Jodhpur, India; {2}Jodhpur City Knowledge and Innovation Foundation, India; {3}Smart Healthcare IDRP, Indian Institute of Technology Jodhpur, India

15:00 - 16:30

C3L-03: LiDAR, Radar, and RF Sensors

Room: Park Suite 3

Session Chair(s): Mehmet Yuce, *Monash University*

15:00

Invited Journal Author

10.1109/JSEN.2023.3245219: Automatic One-Shot LiDAR Alignment Inspection System Using NIR Camera

Hyeong-Seok Song, Young-Keun Kim
Handong Global University, Korea

15:15

Invited Journal Author

10.1109/LSENS.2023.3249645: Memory Conscious Machine Learning Method to Extract Time-of-Flight Data from Flash Lidars

Pooya Poolad, Anthony Chan Carusone
University of Toronto, Canada

15:30

Invited Journal Author

10.1109/JSEN.2023.3260104: A 2D LiDAR-Slam Algorithm for Indoor Similar Environment with Deep Visual Loop-Closure

Zongkun Zhou{2}, Chi Guo{2}, Yanyue Pan{1}, Xiang Li{1}, Weiping Jiang{2}
{1}Artificial Intelligence Institute, Wuhan University, China; {2}GNSS Research Center, Wuhan University, China

15:45

Invited Journal Author

10.1109/JSEN.2023.3250708: Semantic Feature-Enhanced Graph Attention Network for Radar Target Recognition in Heterogeneous Radar Network

Han Meng{1}, Yuexing Peng{1}, Wei Xiang{2}, Xu Pang{1}, Wenbo Wang{1}
{1}Beijing University of Posts and Telecommunications, China; {2}La Trobe University, Australia

16:00

Invited Journal Author

10.1109/JSEN.2023.3242985: RF-Based Drone Classification Under Complex Electromagnetic Environments Using Deep Learning

Hanshuo Zhang{3}, Tao Li{3}, Yongzhao Li{3}, Jinhui Li{1}, Octavia A Dobre{2}, Zhijin Wen{1}
{1}Laboratory of Electromagnetic Space Cognition and Intelligent Control, China; {2}Memorial University of Newfoundland, Canada; {3}Xidian University, China

16:15

Sensors Letters Paper

2073: UWB Bistatic Radar sensor: Across Channels Evaluation

Luca Santoro{2}, Matteo Nardello{2}, Daniele Fontanelli{2}, Davide Brunelli{1}
{1}Alma Mater Studiorum – Università di Bologna, Italy; {2}University of Trento, Italy

15:00 - 16:30

C3L-04: Novel Interfacing Techniques for Sensing Systems

Room: Park Suite 4

Session Chair(s): Wei Tang, *New Mexico State University*

15:00

Invited Journal Author

10.1109/LSENS.2022.3219628: Design of a Quantitative Readout in a Point-of-Care Device for Cisplatin Detection

Edoardo Ragusa{2}, Rodolfo Zunino{2}, Valentina Mastronardi{1}, Mauro Moglianetti{1}, Pier Paolo Pompa{1}, Paolo Gastaldo{2}
{1}Istituto Italiano di Tecnologia, Italy; {2}Università degli studi di Genova, Italy

15:15

Invited Journal Author

10.1109/JSEN.2023.3238074: Parameter Estimation of the Randles Equivalent Electrical Circuit Using Only Real Part of the Impedance

Mitar Simic{1}, Adrian K. Stavrakis{1}, Tijana Koji?{2}, Varun Jeoti{1}, Goran M. Stojanovi?{1}
{1}Faculty of Technical Sciences University of Novi Sad, Serbia; {2}Naturality Research & Development, Spain

15:30

Invited Journal Author

10.1109/JSEN.2023.3243460: Real-Time In-Sensor Slope Level-Crossing Sampling for Key Sampling Points Selection for Wearable and IoT Devices

Mario Renteria-Pinon, Xiaochen Tang
New Mexico State University, United States

15:45

Invited Journal Author

10.1109/LSENS.2023.3259301: 1-B Delta-Sigma ADC Based Power Side-Channel Attack Detection Sensor

Shota Konno, Anupam Golder, Arijit Raychowdhury
Georgia Institute of Technology, United States

16:00

Invited Journal Author

10.1109/LSENS.2023.3268888: Soft Tactile Sensors Having Two Channels with Different Slopes for Contact Position and Pressure Estimation

Hirono Ohashi{3}, Takuto Yasuda{2}, Takumi Kawasetsu{2}, Koh Hosoda{1}
{1}Kyoto University, Japan; {2}Osaka University, Japan; {3}Tokyo University of Agriculture, Japan

16:15

Sensors Letters Paper

2066: A Novel Capacitance-to-Time Converter for Differential-Type Capacitive Sensor Insensitive to Offset Mismatch and Parasitic Capacitance

Narayanan P P, Sreenath Vijayakumar
Indian Institute of Technology Palakkad, India

15:00 - 16:30
C3L-05: Recent Advancement in Sensing Techniques
Room: Park Suite 5
Session Chair(s): Mark Cheng, *The University of Alabama*

15:00

Invited Journal Author

10.1109/LSENS.2022.3203465: Quantum Shot Noise Limit in Rydberg RF Receivers Compared to Thermal Noise Limit in Conventional Antenna

Liam Bussey{2}, Fraser Burton{1}, Kai Bongs{4}, Jonathan Goldwin{3}, Tim Whitley{1}
{1}BT, United Kingdom; {2}BT & University of Birmingham, United Kingdom; {3}ColdQuanta, United States; {4}University of Birmingham, German Aerospace Center, United Kingdom

15:15

Invited Journal Author

10.1109/JSEN.2022.3229771: Pyroelectrically Polarity Switched Electret for Flexible Invisible Digital Memory and Self-Powered Sensors

Pedro González-Losada, Marco Martins, K.B. Vinayakumar
International Iberian Nanotechnology Laboratory, Portugal

15:30

Invited Journal Author

10.1109/LSENS.2023.3268377: Graphene-Based Smart Insole Sensor for Pedobarometry and Gait Analysis

Babar Ali, Negin Faramarzi, Umar Farooq, Hossein Cheraghi Bidsorkhi, Alessandro Giuseppe D'Aloia, Alessio Tamburrano, Maria Sabrina Sarto
Sapienza Università di Roma, Italy

15:45

Invited Journal Author

10.1109/LSENS.2022.3202301: Real-Time DDoS Detection and Alleviation in Software-Defined In-Vehicle Networks

Chin-Ya Huang, Teng-Chia Huang, Yu-Chi Chen
National Taiwan University of Science and Technology, Taiwan

16:00

Invited Journal Author

10.1109/LSENS.2023.3277889: An Embroidery Touch Sensor with Layered Structure of Conductive and Nonconductive Threads

Kazuhiro Shinoda{2}, D. Antony Chacon{1}, Koji Yatani{2}
{1}University of Melbourne, University of Tokyo, Australia; {2}University of Tokyo, Japan

16:15

Sensors Letters Paper

2148: Dipole charge detection: towards the readout of bi-stable charge states in Molecular QCA

Mohammad Istiaque Rahaman, Gergo P Szakmany, Alexei O Orlov, Gregory L Snider
University of Nore Dame, United States

15:00 - 16:30

C3L-06: Sensors in Industrial Practices

Room: Park Suite 6

Session Chair(s): Domenico Balsamo, *Newcastle University*

15:00

INVITED

2088: Unfolding the Future with Smart Road Lighting and Sensing Technology

Adrien Piot
Silicon Austria Labs GmbH, Austria

15:30

1485: Smart Cantilever Probe with Integrated Force and Acoustic Emission Sensor

Florian Tremmel{1}, Oliver Nagler{1}, Christoph Kutter{3}, Rainer Holmer{2}
{1}Infineon Technologies AG, Germany; {2}Regensburg University of Applied Sciences, Germany; {3}Universität der Bundeswehr München, Germany

15:45

1535: Accuracy Evaluation of a Low-Cost Differential Global Positioning System for Mobile Robotics

Christian Blesing, Jan Finke, Sebastian Hoose, Anneliese Schweigert, Jonas Stenzel
Fraunhofer Institute for Material Flow and Logistics IML, Germany

15:00 - 16:30

C3L-07: Optical Sensors - 3

Room: Park Suite 7

Session Chair(s): Axel Dürrbaum, *Kassel Universitaet*
Elizaveta Vereshchagina, *Sintef Digital*

15:00

1216: CMOS Transceiver with Time-Gated 4×8 SPAD Array and Width-Controlled Laser Diode Pulser for Time-Domain Diffuse Optics Measurements

Marko Pakaslahti, Ilkka Nissinen, Jan Nissinen
University of Oulu, Finland

15:15

1623: Optical CMOS Transceiver with 8×32 SPAD Array, 32 TDCs and Laser Diode Driver for Wearable Time-Domain Diffuse Optics Applications

Jan Nissinen, Marko Pakaslahti, Tore Leikanger, Juha Häkkinen, Jaakko Huikari, Ilkka Nissinen
University of Oulu, Finland

15:30
1426: Differential Measurement of a Compact LSPR Biosensor System by Two Filter-Free Wavelength Sensors for Improved Molecular Selectivity
Tsugumi Sakae, Yong-Joon Choi, Tomoya Ide, Kazuhiro Takahashi, Toshihiko Noda, Kazuaki Sawada
Toyohashi University of Technology, Japan

15:45
1895: Automatic Light Intensity Modulation Using TNC-Based Artificial Iris for Smart Contact Lens
Adwait Deshpande, Chayanjit Ghosh, Mohit U. Karkhanis, Aishwaryadev Banerjee, Erfan Pourshaban, Md. Rabiul Hasan, Amirali Nikeghbal, Md Golam Dastgir, Hanseup Kim, Carlos H. Mastrangelo
University of Utah, United States

16:00
1766: Novel Single Bubble Haptic Sensor: SubbleSight
Debadutta Subudhi, Manivannan M
Indian Institute of Technology Madras, India

16:15
1135: Combination of Organic and Inorganic Semiconductor for Sensing Applications
Karsten Fehse, Michael Toerker, Dirk Schlebusch, Stephan Brenner, Judith Baumgarten, Martin Rolle, Philipp Wartenberg, Bernd Richter, Uwe Vogel
Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP, Germany

15:00 - 16:30
C3L-08: Sensor Data Processing & AI: Automotive Perception
Room: Park Suite 8
Session Chair(s): Ingrid Ullmann, *Friedrich-Alexander-Universität Erlangen-Nürnberg*
Ive Weygers, *Friedrich-Alexander-Universität Erlangen-Nürnberg*

15:00
1908: MIMO Digital Radar Processing with Spatial Nulling for Self-Interference Mitigation
Pietro Stagnaro{2}, Ashish Pandharipande{2}, Jeroen Overdevest{2}, Hamdi Joudeh{1}
{1}Eindhoven University of Technology, Netherlands; {2}NXP Semiconductors, Netherlands

15:15
1044: Deep Learning-Based Resolution Enhancement in SAR Image for Automotive Radar Sensors
Sung-Wook Kang, Hahng-Jun Cho, Hojung Lee, Seongwook Lee
Chung-Ang University, Korea

15:30
1532: Sensor Fusion by Spatial Encoding for Autonomous Driving
Quoc-Vinh Lai-Dang, Jihui Lee, Bumgeun Park, Dongsoo Har
Korea Advanced Institute of Science and Technology, Korea

15:45
1235: Joint Probabilistic Data Fusion for Pedestrian Detection in Multimodal Images
Zuhaib Ahmed Shaikh{1}, David Van Hamme{2}, Peter Veelaert{2}, Wilfried Philips{2}
{1}Ghent University, Imec, Belgium; {2}TELIN-IPI, Ghent University - imec, Belgium

16:00
1346: Multispectral Pedestrian Detection with Visible and Far-Infrared Images Under Drifting Ambient Light and Temperature
Masato Okuda, Kota Yoshida, Takeshi Fujino
Ritsumeikan University, Japan

16:15
1188: Multi-LiDAR Localization and Mapping Pipeline for Urban Autonomous Driving
Florian Sauerbeck, Dominik Kulmer, Markus Pielmeier, Maximilian Leitenstern, Christoph Weiß, Johannes Betz
Technische Universität München, Germany

15:00 - 16:30
C3L-09: Magnetometers and Navigation Sensors
Room: Park Suite 9
Session Chair(s): Christian Schott, *Melexis Technologies*
Salvatore Pullano, *University of Catanzaro*

15:00
1604: Wide Dynamic Range of a MEMS Differential Resonant Accelerometer with Asymmetric T-Shaped Electrodes
Kei Masunishi, Etsuji Ogawa, Daiki Ono, Fumito Miyazaki, Kengo Uchida, Jumpei Ogawa, Hideaki Murase, Fumitaka Ishibashi, Yasushi Tomizawa
Toshiba Corporation, Corporate Resarch & Development Center, Japan

15:15
1381: Electrostatically Actuated SOI In-Plane Motion Platform for In-Situ Calibration of Micro Gyroscopes
Erez Benjamin{2}, Ronen Maimon{1}, Aviv Ronen{1}, Eldad Yichie{1}, Slava Krylov{2}
{1}RAFAEL Advanced Defense Systems Ltd, Israel; {2}Tel Aviv University, Israel

15:30
1007: Yttrium Iron Garnet Magnetometers with 1 nT/√Hz Sensitivity
Massood Tabib-Azar, Olivia Thu Lam
University of Utah, United States

15:45
1211: Active Compensation of Non-Orthogonality in CMOS Vertical Hall Based Angle Sensors Tobias Gnos{2}, Reto Besserer{2}, Yves Mermoud{2}, Serge Reymond{1}, Pierre-Francois Bourdelle{1}, Pavel Kejik{1}, Christoph Würsch{2}, Samuel Huber{2}
{1}MPS Tech Switzerland Sàrl, Switzerland; {2}University of Applied Sciences of Eastern Switzerland , Switzerland; {2}University of Applied Sciences of Eastern Switzerland, Switzerland

16:00
1751: Pitot Tube Type Compact Waterproof Airflow Sensor for Seabird Biologging
Takuto Hirayama, Takuto Kishimoto, Hidetoshi Takahashi
Keio University, Japan

16:15
1824: Flight-Testing of a MEMS Wall Shear Stress Thermal Sensor on a Microlight Aircraft
Cecile Ghouila-Houri{2}, Thomas Arnoult{2}, Aurelien Mazzamurro{2}, Sylvain Kern{2}, Romain Viard{3}, Damien Teillet{1}, Emma Palfi{1}, Eric Garnier{4}, Abdelkrim Talbi{2}, Philippe Pernod{2}
{1}ARESIA, France; {2}Centrale Lille, France; {3}JMH Conception, France; {4}ONERA, France

16:30 - 17:30
Conference Award Ceremony (supported by the IEEE MEMS Technical Community) / 2024 Conference Announcement
Room: Grand Park Hall
Session Chair(s): Svetlana Tatic-Lucic, *Lehigh University*
Yi Chiu, *National Yang Ming Chiao Tung University*

17:30 - 18:00
Closing Remarks
Room: Grand Park Hall