IEEE SENSORS 2025

Vancouver, Canada || October 19 - 22, 2025

IEEE SENSORS 2025
CONFERENCE PROGRAM

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WELCOME MESSAGE

Welcome to IEEE SENSORS 2025!

On behalf of the organizing committee, we are pleased to welcome you to Vancouver, Canada, for IEEE SENSORS 2025, taking place October 19–22 at JW Marriott Parq Vancouver, located in the city's entertainment and sports district. Surrounded by mountains and ocean, Vancouver offers an inspiring setting for this year's gathering of the global sensing community.

Being the flagship conference of IEEE's largest technical entity, the IEEE Sensors Council, the IEEE SENSORS Conference brings together researchers, engineers, practitioners, and students from across IEEE's 26 member societies and beyond. Since 2002, IEEE SENSORS has been a premier international platform for showcasing and discussing innovations in materials, devices, systems, and sensor applications.

IEEE SENSORS 2025 continues its longstanding traditions of excellence in technical quality and networking opportunities at the conference. The program features topical workshops and tutorials, a comprehensive schedule of lectures and posters, live demonstrations, sessions on emerging areas, and the continued journal–conference synergy program.

This year's technical program includes 391 Option A papers from 712 regular submissions, 112 Option B papers from 205 journal–conference synergy submissions, and 56 pre-published journal presentations, along with four focused sessions. Amidst the recent global disruptions, these numbers reflect the strong engagement of the global sensing community and the diversity of research represented at the conference.

Additionally, the organizing committee members have tirelessly worked to bring in several exciting new initiatives that demonstrate our dedication to fostering innovation, inclusivity, and professional growth:

- The **Sensorpreneur Pitch Competition**, a new entrepreneurship-focused program, encourages sensor research and commercialization, with continuous mentoring for finalists and awards for the best pitch and idea.
- **Career Fair** and **Career Development Workshop Series** under the LaunchPad program offer dedicated opportunities for students and early-career professionals to explore career options and enhance their skills.
- An expanded **Industry Day**, including an industry-organized track, showcases, demonstrations, and a networking luncheon, aims to strengthen connections between academia and industry.
- Family care support is provided through new **family care grants** and dedicated childcare options, reflecting our commitment to making the conference more inclusive for attendees with families.
- **Post-conference tours** allow participants to discover Vancouver and the surrounding region, adding a cultural and social element to the technical program.
- We have established a structured process to acknowledge **outstanding lecture and poster** presentations by authors, while also expanding travel award opportunities to enhance access and support for student researchers globally.

Three distinguished plenary speakers will present recent research developments and emerging trends that are relevant to a broad segment of our community:

- Lakshminarayanan Mahadevan (Harvard University, USA)
- Xiaoyi Bao (University of Ottawa, Canada)
- Chengkuo Lee (National University of Singapore)

Community-focused events remain a key part of the conference. The Women in Sensors (WiSe), Young Professionals (YP), Diversity & Inclusion (D&I), and CEC committees will host sessions, panels, and networking opportunities throughout the week, including the WiSe panel on interdisciplinary perspectives in sensor innovation.

Finally, the conference experience extends beyond the technical sessions with social events such as the welcome reception and Gala Dinner, as well as the post-conference tours, providing opportunities to forge lasting connections while enjoying Vancouver's unique cultural and natural scenery.

IEEE SENSORS 2025 is made possible through the collaborative efforts of many volunteers, reviewers, sponsors, and participants. We thank everyone for your contributions and for bringing your ideas and energy to Vancouver.

Welcome to Vancouver, and welcome to IEEE SENSORS 2025!

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Track 4: Microfluidics and Biosensors
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Shih-Kang Fan, *Kansas State University, USA*

Track 5: Optical Sensors
Cristian Manzoni, *Polytecnico Milano, Italy*
Michiko Nishiyama, *Soka University, Japan*

Track 6: Physical Sensors: Temperature, Mechanical, Magnetic and Others
Ensieh Hosseini, *Durham University, UK*
Zhu Yao*, Institute of Microelectronics, Singapore*

Track 7: Acoustic and Ultrasonic Sensors
Edmond Cretu, *University of British Columbia, Canada*
Sri-Rajasekhar (Raj) Kothapalli, *The Pennsylvania State University, USA*

Track 8: Sensor Networks and IOT
Brendan O'Flynn, *Tyndall National Institute, Ireland*
Sebastian Bader, *Mid Sweden University, Sweden*

Track 9: Emerging Sensor Technologies and Applications
Andrew Steckl, *University of Cincinnati, USA*
Bonnie Gray, *Simon Fraser University, Canada*

Track 10: Sensor Systems: Signals, Processing and Interfaces
Hengky Chandrahalim, *U.S. Air Force Institute of Technology, USA*
Michael Sherburne, *The Johns Hopkins University Applied Physics Laboratory, USA*

Track 11: Actuators, Energy Harvesters and Powering Sensors
Pai-Yen Chen, *Univeristy of Illinois Chicago, USA*
Darrin J Young, *The University of Utah, USA*

Track 12: Sensor Data Processing and AI
André Eugenio Lazzaretti, *Federal University of Technology – Paraná, Brazil*
Ashish Pandharipande, *NXP Semiconductors, Netherlands*

Track 13: Wearable Sensors and Systems
Eloise Bihar, *University at Buffalo, USA*
Anna Maria Pappa, *Khalifa University, UAE*

Track 14: Sensors in Industrial Practices
Debabrata Bhattacharyya, *IISc Bangalore, India*
Sara Pellegrini, *ST Microelectronics, Ireland*

Track 15: Live Demonstration of Sensors and Sensing Technologies
Tina Shoa Hassani Lashidani, *Simon Fraser University, Canada*
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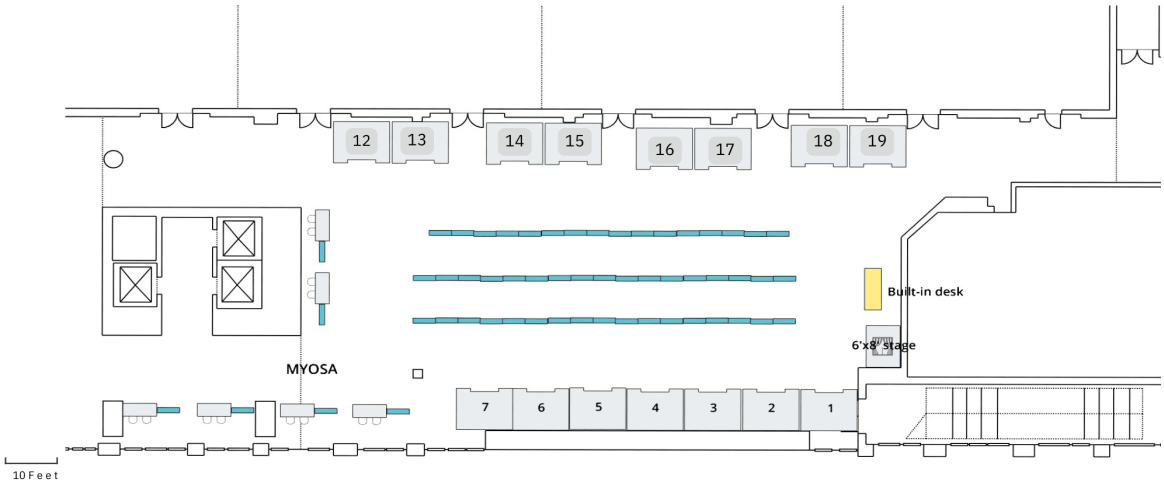
EXHIBIT HALL LAYOUT

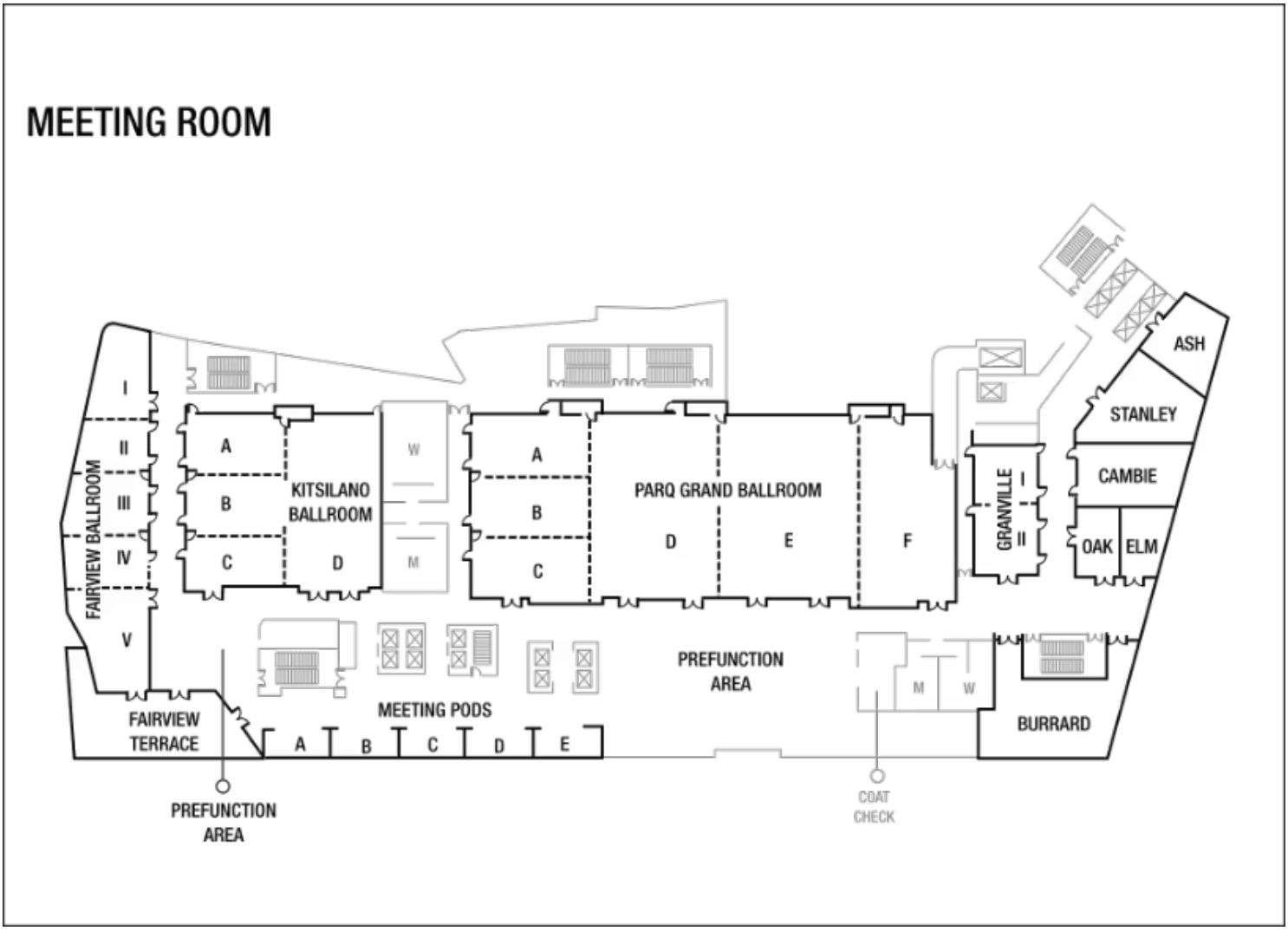
Parq Grand Ballroom Prefunction Area



Parq Pre-function - MYOSA for IEEE - October 18, 2025 at 12:00 AM

1 - Fraunhofer ENAS
2 - SmarAct Metrology
3 - Zurich Instruments
4 - China Instrument and Control Society
5 - Nextron
6 - IEEE MEMS Technical Community
7 - Gore
12 - Voltera
13 - Neuranics
14 - Destination Vancouver
15 - SIJTechnology, Inc.
16 - STMicroelectronics
17 – IEEE Sensors Journal
18-19 - IEEE Sensors Council

VENUE MAP


MEETING ROOM
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COAT CHECK
BURRARD

PLENARY SPEAKERS

Lakshminarayanan Mahadevan
Harvard University, USA

Wisdom of the Swarm: Collective Behavior in Bugs, Bots and Beyond

Monday | October 20, 2025 | 9:00 - 10:00

Super-organisms, exemplified by insect societies, solve complex problems collectively, sans plan or planner, on scales much larger than the individual. Motivated by observations in the field and in the lab, I will describe how different orders of social insects actively regulate their micro-environment by constructing and deconstructing complex functional architectures. By linking physics and behavior on multiple scales using local sensing and action mediated by global environmental fields, these examples point to a kind of embodied physical intelligence. To synthesize these complex collective behaviors in-vitro, I will also describe our experiments using simple robots that sharpen some questions raised a long time ago by Tinbergen, Turing and others. I will close with some lessons these studies might (or might not) mean more broadly for more cognitively capable collectives.

Xiaoyi Bao
University of Ottawa, Canada

Fiber Optic Sensing: Transforming Optical Fibers into Intelligent Monitoring Systems

Tuesday | October 21, 2025 | 11:00 - 12:00

Fiber optic sensing has transformed the way we monitor our world, turning optical fibers into intelligent networks capable of detecting changes in temperature, strain, acoustic wave and vibrations over vast distances. By leveraging the fundamental properties of light in fibers—such as phase, polarization, frequency spectrum and scattering—these sensors provide real-time insights for critical infrastructure and environmental monitoring. This keynote will explore the science behind principle of fiber sensing and detection, distributed fiber sensing, highlighting the limitations and breakthroughs in optical technology enable large-scale, high-precision and dynamic measurements. From preventing infrastructure failures to advancing power and energy pipe and environmental monitoring, fiber sensors are shaping the future of smart sensing. As the need for real-time, remote, and multi-parameter and high precision monitoring grows, this talk will discuss the challenges and opportunities in this rapidly evolving field.

Chengkuo Lee
National University of Singapore, Singapore

AI Sensors and Edge AI Applications

Wednesday | October 22, 2025 | 10:30 - 11:30

With the growing demand for energy-efficient AI applications, the rapid development of self-powered sensors together with edge computing and edge AI technology at the sensor nodes has led to the new era of AI sensors. Traditional sensors and sensing systems can no longer meet the demands for real-time multimodal sensing and large-scale data processing, leading to a shift towards a new paradigm of AI Sensors and Artificial Intelligence of Things (AIoT) sensing systems with integrated computational intelligence. Self-powered wearable sensors have promoted low-power or battery-free sensing platforms for applications including human-machine interaction, soft robotics, and electronic skin (e-Skin). Tactile sensors featuring artificial neuron like self-generated zero-biased signals are developed to realize synergistic sensing of multimodal information (vibration, material, texture, pressure, and temperature) in a single device will be discussed first. On the other hand, aiming at smart farming, various AIoT sensing systems have been developed recently. A multifunctional hydrogel is developed as a stable energy harvester that continuously generates direct current (DC) output with an average power density of 1.9 W m-3 for nearly 60 days of operation in normal environments (24℃, 60% RH). Moreover, this hydrogel enables noninvasive and self-powered monitoring of leaf relative water content (RWC), providing critical data on evaluating plant health, previously obtainable only through invasive or high-power consumption methods. The e-skin sensors for indoor and outdoor farming applications will be discussed in this talk as well. Thirdly, the emergence of "in-sensor computing and near-sensor computing" demonstrates the sensor nodes or edge applications with computational capabilities, reducing data transmission burdens while enhancing privacy and energy efficiency. Using optical edge computing platform advanced by Si Photonics sensors, optical edge AI sensors have become an attractive approach for enabling intelligent, energy-efficient, adaptive sensing networks.

PRE-CONFERENCE TUTORIAL & WORKSHOP SCHEDULE – SUNDAY, OCTOBER 19

Tutorials

PDT	Parq Salon C	Kitsilano A	Kitsilano B
8:30-10:00	Foundation Models for Wearable Sensor Data	Tensor Decompositions for Multidimensional Signal Processing - Part 1	
10:00-10:30	Coffee Break		
10:30-12:00	Unlocking New Performance Horizons in Gas Sensing by Cross-Pollination between Contemporary Hardware and Mathematics	Tensor Decompositions for Multidimensional Signal Processing - Part 2	Large area E-skin with tomographic sensors
12:00-13:30	Lunch Parq Salon F		
13:30-15:00	Modelling and simulations of biosensors: from analytical to machine learning approaches	Terahertz Sensing Technology	From antifouling (nano-)coatings to smart biosensing in complex media
15:00-15:30	Coffee Break		
15:30-17:00	Sensor transform using Deep Learning: from technology to application	Advancing electrochemical field effect transistor(FET) biosensing technology: emphasis on clinical/field translation	MEMS Micromirrors for Miniaturized Projection and 3D Sensing
17:00-17:30			

Workshops

PDT	Fairview I-III	Fairview IV-V	Parq Salon B
8:30-10:00	Wireless and Batteryless Sensors: Towards AIoT	Future CMOS Image Sensors for AI Era – AI or not	Professional Development Programming for Young Professionals in Sensing
10:00-10:30			
10:30-12:00	Wireless and Batteryless Sensors: Towards AIoT	Future CMOS Image Sensors for AI Era – AI or not	Professional Development Programming for Young Professionals in Sensing
12:00-13:30			
13:30-15:00	Exploring Consumer Inertial MEMS – High-Tech Sensors at Your Fingertips	Future CMOS Image Sensors for AI Era – AI or not	Emerging Trends in Chemical and Biochemical Sensors: MEMS, Electrochemical, and Optical Platform
15:00-15:30			
15:30-17:30	Exploring Consumer Inertial MEMS – High-Tech Sensors at Your Fingertips	Future CMOS Image Sensors for AI Era – AI or not	Emerging Trends in Chemical and Biochemical Sensors: MEMS, Electrochemical, and Optical Platform

PRE-CONFERENCE TUTORIALS

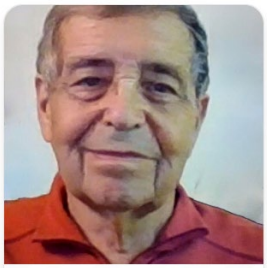
Manuch Soleimani
University of Bath

Large area E-skin with tomographic sensors

Tomographic imaging based e-skin sensors offer a unique solution for sensing for many applications. This includes artificial skins in robotics, medical application for interfacing with human skin. Additionally this type of e-skin will have a key role in ever growing and emerging field of flexible and soft robots. In this tutorial we will show the application of tomographic imaging systems for e-skin application. We cover the variety of sensing and imaging system, including resistivity, capacities, magnetic, acoustic and fiber optic based sensing. The tutorial will cover the sensor design, data collection and tactile performance analysis. Data analysis, image reconstruction and multi-modality based e-skin will be covered in this tutorial. The tutorial will be interactive and the participant with a great deal of interest in image creation with deep learning or other methods should be able to participate in analysis activities during tutorial.

Sensor transform using Deep Learning: from technology to application
Henry Leung, *University of Calgary* & Hongqi Zhang, *Northeastern University at Qinhuangdao, China*

Sensor transform processes and converts raw data across different sensor modalities restructuring inputs into meaningful representations to enhance machine perception and decision-making. From remote sensing to autonomous systems, sensor transform has the potential to break down barriers between different sensor modalities, reshaping how we design and integrate intelligent systems for a more seamless and efficient future. Sensor transform facilitates data conversion across modalities within heterogeneous sensor systems, enhancing decision support for applications in autonomous systems, remote sensing, industrial inspection, and medical imaging. The emergence of deep learning-based technologies offers a compelling alternative that enables systems to reduce reliance on expensive sensors while enhancing environmental awareness. This tutorial will explore the fundamentals and applications of sensor transform, focusing on both traditional methods and deep learning-based approaches. We will examine how sensor transform enables cross-modal data conversion, enhancing perception in fields like remote sensing, industrial inspection, and autonomous systems. Key topics include optical-to-SAR and MFL-to-laser transformations, along with the role of deep learning in improving accuracy and adaptability. We will also discuss challenges such as data alignment, real-time processing, and generalization across different sensor types, highlighting solutions for seamless integration without additional hardware modifications.



Michael Shur
Rensselaer Polytechnic Institute

Terahertz Sensing Technology

The illustrious history of terahertz (THz) imaging and sensing is nearly 50 years long. During this time, photonic and electronic THz technology has developed a lot, but it has not been able yet to bridge the famous THz gap between electronic and photonic devices. In the THz range of frequencies, a low photon energy (smaller than the room temperature thermal energy) makes the development of efficient THz lasers to be a challenge. And the cutoff frequency and maximum frequency of operation of field effect and bipolar transistors struggles to reach one THz. Figure 1 shows the state of THz photonic and optoelectronic technologies competing for applications in THz sensing. Also shown is the expected order of magnitude performance improvement that could be achieved using synchronized arrays of active “plasmonic unit cells” – plasmonic crystals. TeraFETs – short-channel Si CMOS, SOI, FINFETs, GaAs-based and GaN-based HEMTs – operating in a new “plasmonic” regime – form unit cells of such plasmonic crystals. TeraFETs have the potential to become a dominant THz electronics technology. As seen from Fig. 1, deep submicron Si CMOS TeraFET circuits could support THz sensing, which is the key to a dramatic cost reduction of the THz technology deployment. Many theoretical and modeling papers and a few experimental papers have revealed the enormous potential of the TeraFET plasmonic crystal technology. Reaching this potential requires understanding of new counterintuitive physics of TeraFET plasmonic crystals. This physics involves the propagating, decaying, or growing waves of the electron density – plasma waves” - similar to water and sound waves driven by wind. THz sensing technology has found applications in industrial controls, the detection of biological and chemical hazardous agents, biology, medicine (including cancer diagnostics), detection of mines and explosives, providing security in buildings, airports, and other public spaces, radioastronomy, space research, and hardware cyber security (detecting tampered with or defective VLSI non-destructive and with or without bias).

Chirasree RoyChaudhuri
Indian Institute of Engineering Science and Technology

Advancing electrochemical field effect transistor (FET) biosensing technology: emphasis on clinical/field translation

Field-effect transistor (FET)-based sensors offer high sensitivity, rapid detection and compatibility with large-scale semiconductor fabrication, making them ideal for point-of-care diagnostics. Recent advances leverage one- and two-dimensional materials with high surface area-to-volume ratios and excellent charge carrier mobility, greatly enhancing sensing performance. Notable examples include MoS_2, metal dichalcogenides, graphene and MXenes, which have demonstrated superior sensitivity. These nanostructured materials are driving the next generation of electrochemical FET sensors with improved efficiency and scalability. This tutorial will focus on the advancement in the electrochemical field effect transistor technology towards detection of biomarkers in clinical samples and for monitoring of contaminants in food and water samples with emphasis on the adoption of machine learning algorithms for mitigating the device to device variability and overcoming the background noise of non-specific proteins/ contaminants in physiological/environmental samples. The ultimate limit of detection of these sensors will be established from the physical principles guiding the antibody-antigen binding which will lead to their systematic design approach. Discussion will be augmented by case studies of these sensors applied on patient cohorts targeting cancer and infectious diseases and on environmental water and food samples, highlighting the existing challenges related to their exploitation in near-field and resource limited settings.

PRE-CONFERENCE TUTORIALS

Vihar Georgiev
University of Glasgow

Modelling and simulations of biosensors: from analytical to machine learning approaches

Biosensors can be broadly classified into different types based on the method used for signal transduction, including electrochemical, optical, thermal, piezoelectric and magnetic biosensors. Due to a vast area of possibilities, in this tutorial, I will focus my attention on electrochemical biosensors and I will discuss the underlying physical and electrical principles of operations and their areas of applications. Using simulations and modelling is the most cost, time and resource effective method to test new devices and explain physical, chemical and electrical concepts. To explain the operation of such electrochemical biosensor devices, I will present different simulations methods and approaches. This tutorial will cover various simulation techniques covering analytical and numerical methods and how these approaches are used to train neural networks. I will discuss the advantages and disadvantages of each of these methods and summarise the current state of the art in modelling of biosensors. I will use practical examples and case study emphasizing how hybrid modelling strategies can bridge the gap between physics-based and data-driven models.

Sayeh Bayat
University of Calgary

Foundation Models for Wearable Sensor Data

Foundation models are rapidly transforming the analysis of wearable sensor data by enabling robust, generalizable learning from massive unlabeled datasets. Originally developed for language and vision, these models are now being adapted to time-series data from wearable devices—offering new capabilities in health monitoring, activity recognition, and digital phenotyping. This tutorial provides a comprehensive overview of emerging approaches for applying foundation models to large-scale wearable sensor data. We will cover self-supervised learning techniques for extracting transferable representations, strategies for multimodal sensor fusion, and the empirical effects of scaling data, compute, and model parameters. Participants will be introduced to state-of-the-art architectures and training paradigms, including masking-based pretraining and few-shot learning. Case studies will illustrate how these models improve imputation, extrapolation, and classification performance in real-world sensing contexts. Designed for researchers and engineers in sensor analytics, mobile health, and machine learning, the session combines technical foundations with practical examples. Attendees will gain actionable insights into building scalable and sample-efficient models for longitudinal, multimodal sensor data—and explore the frontier of general-purpose models for personalized sensing.

Paolo Frigerio
Politecnico di Milano

MEMS Micromirrors for Miniaturized Projection and 3D Sensing

MEMS micromirrors have been proposed and adopted in many different laser-beam-scanning (LBS) applications, starting from barcode reading, and ranging to both medical, consumer and automotive applications, such as miniaturized projection, augmented-reality (AR) headsets and LiDAR/3D sensing. The main architecture adopted in these fields consists in two-dimensional scanning of a laser source using either a bi-axial device or a couple of mono-axial ones. As these applications increase in complexity, requiring more and more accurate scanning devices with ever increasing field-of-view, the challenges inherent in the optical device fabrication, sensing and control of the mirror inclination, synchronization and cross-talk of the two axes, become increasingly challenging. The tutorial will provide an in-depth discussion about the most relevant trends and the most successful technologies used in the field, focusing in particular on recent advancements in the use of piezoelectric technologies for both actuation and sensing of the mirror inclination. Starting from a historical perspective on the evolution of MEMS scanners, the tutorial will then address the most prominent challenges faced in sensing and control, both at the mechanical and the sensing electronic and system level.

Radislav A. Potyrailo
GE Vernova Advanced Research

Unlocking New Performance Horizons in Gas Sensing by Cross-Pollination between Contemporary Hardware and Mathematics

Contemporary gas-monitoring demands push existing gas sensor designs to their fundamental limits in “3S” requirements of Sensitivity, Selectivity, and Stability. The origin of these limits is in the single-output (e.g., resistance, light intensity) sensor designs, also known as zero-order sensors. Any zero-order sensor is affected by chemical background and sensor drift that cannot be distinguished from the response to an analyte. This tutorial will bridge the gap between existing and required gas detection capabilities by single-output sensors, sensor arrays, and traditional analytical instruments. Inspired by mathematics behind the first- and second-order traditional analytical instruments, next-generation gas sensors are being designed on four pillars: (1) physical transducer with excitation to operate with independent variables, (2) sensing material with different responses to multiple volatiles under variable excitation, (3) excitation to achieve independent responses, (4) data analytics for multi-gas differentiation, rejection of interferences, and drift self-correction. Next-generation sensors are attractive in scenarios when traditional analytical instruments cannot be used because of their size, power, and periodic maintenance requirements. By the end of the tutorial, attendees will have a good understanding of design rules for building such next-generation sensors and will relate to how these sensors may be utilized in their envisioned applications.

PRE-CONFERENCE TUTORIALS

Hana Vaisocherová – Lísalová
FZU – Institute of Physics of the Czech Academy of Sciences

From antifouling (nano-)coatings to smart biosensing in complex media

Despite outstanding performance in laboratory environments, only a limited number of novel biosensor concepts transition into practical point-of-care (POC) or on-site detection devices. Key obstacles include limited robustness, cost constraints, and biofouling in complex biological samples. A major unmet challenge lies in engineering antifouling biofunctional surfaces that simultaneously support high biorecognition efficiency, resist biofouling, and allow scalable, reproducible sensing performance. This tutorial presents recent advances in antifouling strategies for biosensing applications, focusing on: (i) molecular mechanisms of biofouling to inform rational surface design; (ii) advanced tools for characterizing ultrathin antifouling (nano)coatings; (iii) biofunctionalization; (iv) integrated approaches for on-chip polymer synthesis using microfluidics; and (v) examples of antifouling label-free optical, electrochemical, and piezoelectric biosensors in clinical and environmental applications. Special attention will be given to emerging hydrophilic materials, including zwitterionic and non-ionic polymer brushes, and their remarkable antifouling behavior. The tutorial will also highlight challenges in accurately quantifying fouling levels, particularly when using standard techniques such as SPR. Interactive discussion will address how to optimize biofunctionalization without compromising antifouling properties, and how molecular insights can guide the scalable fabrication of robust biosensing platforms. Ultimately, next-generation antifouling coatings may enable reliable, high-performance POC diagnostics with real-world impact, from environmental surveillance to precision medicine.

Sherif S. Sherif
University of Manitoba, Winnipeg, Canada

Tensor Decompositions for Multidimensional Signal Processing

This introductory tutorial addresses problems of storing and/or multilinear processing of very large multidimensional data arrays (tensors) that could possibly result from multi-sensor measurements. After introducing basic tensor operations, we will cover both theoretical and computational aspects of two classic tensor decompositions: Canonical Polyadic Decomposition (CPD) and Tucker Decomposition (TD). We will also introduce the concept of Tensor Networks, with particular emphasis on the relatively recent Tensor Train Decomposition (TTD).

PRE-CONFERENCE WORKSHOPS

Professional Development Programming for Young Professionals in Sensing

Its never too early (or late) to begin preparing for your next steps. In this workshop series, we will offer key insights into how to begin to prepare for the next stage of your career. The content is specifically designed for students, postdoctoral researchers, and early industry professionals. The discussion will focus on both academic and industrial career paths, with the goal of providing you new insights and skills needed for success. We will split the workshop into three sessions. The first two sessions will be led by Pallavi Eswara. In the first session, we will discuss methods for building your brand and professional activity. In this interactive session, students and postdocs will learn more about how to lay the foundation of how their experience will be perceived in the job market. The second session will focus on career exploration and preparation techniques through both presentation and guided discussion. The third session, led by Jason Weigold, will focus on the career exploration in industry process. Finally, the workshop will end with a question-and-answer panel. The panelists will discuss their experience in the hiring process and provide key insights related to successes they've experienced. The panel is designed to be interactive, with significant time allotted for audience questions. In summary, this workshop will provide valuable insight that will amplify your impact on the field of sensors for years to come.

Pallavi Eswara
University of Florida
Biography

Jason Weigold
MEMStaff Inc.
Biography

PRE-CONFERENCE WORKSHOPS

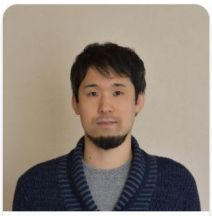
Future CMOS Image Sensors for AI Era – AI or not

Artificial intelligence (AI) is becoming increasingly integrated into our daily lives. In particular, Deep Neural Networks (DNNs) are expected to merge with CMOS Image Sensors (CISs), which, soon, will open up a new era of smart, adaptive, and autonomous systems in various consumer electronics, such as smartphones, automotive technology, and augmented/virtual reality glasses. This workshop will focus on the future CISs that incorporate state-of-the-art computational image sensor processors (ISPs). These capabilities have evolved from traditional computation to DNNs in the AI era. Industry leaders and academic researchers will present invited talks covering two major topics:

1. Trends in CISs technology focused on computation, including neural networks for future applications and associated software.
2. Sensor technologies and ISPs designed for the AI era, and Sensor simulations tailored for future CISs

We believe this workshop will pave the way for advancements in future imaging and sensing technology. We encourage all attendees of the IEEE SENSORS 2025 conference to engage in discussions about "Future CMOS Image Sensors for AI Era – AI or not".

Syed Salman Rahman
Sr. Application Engineer at STMicroelectronics
Biography



Daisuke Saito
OmniVision Technologies
Biography

Sozo Yokogawa
Sony Semiconductor Solutions Corporation
Biography

Johannes Solhusvik
Head of Sony Semiconductor Solutions Europe
Biography

Mohit Gupta
University of Wisconsin-Madison
Biography

Seokho Yun
Samsung Advanced Institute of Technology (SAIT)
Biography

Brian A. Wandell
Stein Family Professor of Psychology' Electrical Engineering, Ophthalmology and Graduate School of Education (by courtesy), Stanford University
Biography

Zhao Wang
Research Scientist at Meta Reality Labs
Biography

Dan McGrath
TechInsights
Biography

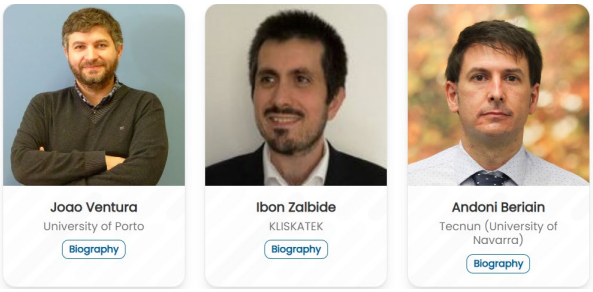
PRE-CONFERENCE WORKSHOPS

Wireless and Batteryless Sensors: Towards AIoT

Ambient Internet of Things (AIoT) is set to transform how everyday objects interact with their environment. By integrating battery-free devices capable of sensing factors like location, temperature, and humidity, AIoT enables seamless data transmission through existing wireless infrastructure such as smartphones, smart appliances, and access points. This advancement opens new opportunities for industries like retail, healthcare, and logistics to scale efficiently. Additionally, the data generated by AIoT fuels AI applications, helping both businesses and consumers make smarter, data-driven decisions.

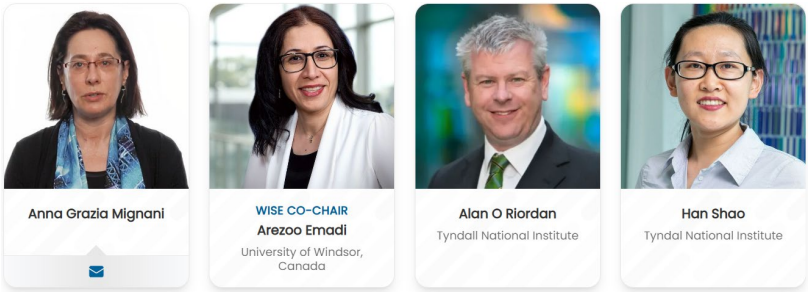
However, implementing Ambient IoT brings key technical challenges:
- a shift from designing for power-limited to energy-limited systems.
- the need for efficient, innovative use of ambient energy sources with minimal output power.
- development of specific circuits to overcome the specific need of this new use case.
- exploration and adaptation of current low-power communication standards for this purpose.

These challenges and potential solutions will be explored in this session, including a live demonstration.



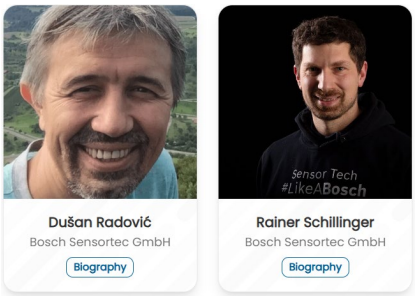
Emerging Trends in Chemical and Biochemical Sensors: MEMS, Electrochemical, and Optical Platform

Emerging Trends in Chemical and Biochemical Sensors: Advances in MEMS, Electrochemical, Optical Platforms, and New Horizons in System Integration and AI/ML Data Analytics. This workshop will explore the latest advancements across electrochemical, MEMS-based, and optical sensing platforms for chemical and biochemical applications. In addition to discussing novel sensor device innovations, we will introduce two critical emerging areas: sensor system integration strategies and the application of AI/ML techniques for advanced sensor data analysis. Through expert talks, real-world case studies, and dynamic discussions, participants will engage with breakthroughs in device design, new materials, multi-modal integration, and intelligent data interpretation. The workshop will provide a comprehensive view of how traditional sensor technologies are evolving alongside new enabling methodologies, fostering collaboration across hardware, systems, and data science communities.



Exploring Consumer Inertial MEMS – High-Tech Sensors at Your Fingertips

Micro Electro-Mechanical Systems (MEMS) are integral to a wide range of modern applications. This workshop focuses on a specific class of MEMS sensors—inertial measurement units (IMUs)—which are commonly found in consumer electronic devices, enabling functionalities such as motion detection, orientation tracking, and gesture recognition. Participants will have the opportunity to explore these sensors hands-on—either by using the inertial sensors in their own smartphones or tablets, or by experimenting with demo sensor boards provided during the workshop.



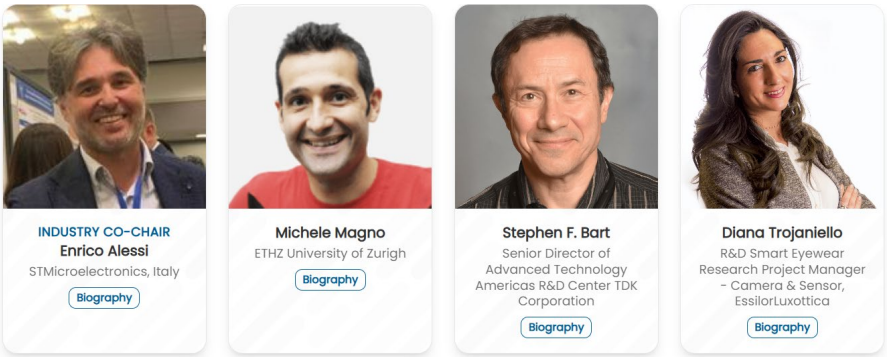
IN-CONFERENCE WORKSHOP – TUESDAY, OCTOBER 21

*In-Conference Workshops are included in full conference registration and do not require an additional payment to register.

Room: Fairview III & IV
First session from 1:00 pm to 3:00 pm
Second session from 3:30 pm to 6:00 pm

Generative AI Applied to Sensor Technology

The convergence of Generative AI (GenAI) and sensor technology is poised to revolutionize numerous industries by enhancing the accuracy, efficiency, and capabilities of sensor data interpretation. This workshop aims to explore the innovative applications of GenAI in various fields, including environmental monitoring, industrial automation, smart cities, and more. Participants will delve into the development of AI models that can predict and simulate complex scenarios based on sensor data, the use of generative models to create synthetic data for training and testing, and the integration of AI-driven sensors in diverse applications. The workshop will highlight how GenAI can improve decision-making processes, optimize resource management, and enhance the overall functionality of sensor networks. Keynote speakers from academia and industry will share their insights on the latest advancements and practical applications of GenAI in sensor technology. Interactive sessions will provide hands-on experience with AI tools and frameworks, fostering collaboration and innovation among attendees. This workshop is an excellent opportunity for researchers, practitioners, and students to network, exchange ideas, and contribute to the future of sensor technology across various sectors. STMicroelectronics, TDK, Datwyler, Pison Technologies, Essilor Luxottica together with relevant institutes of Research such as ETHZ and Scuola Superiore Sant'Anna are only some of the participants of this vibrant and exciting workshop.



FOCUSED SESSIONS

Sensor fusion with time synchronization
Motoaki Hara, *National Institute of Information and Communications Technology (NICT), Japan*
Yoshikazu Hirai, *Kyoto University, Japan*

Sensor fusion is an effective approach that combines data from various sensors, cameras, and spectrometers to derive meaningful information with exceptional reliability and stability. This concept has been discussed since the inception of sensors. Today, significant advancements in clock stabilization technologies, including miniaturized atomic clocks, and synchronization algorithms like the Precision Time Protocol (PTP) have opened up new opportunities for effective data fusion. Additionally, the incorporation of data assimilation and digital virtualization, driven by machine learning, has greatly enhanced these possibilities. This session will focus on the transformative potential of these advancements in sensor fusion.

Sensors for animal monitoring and diagnostics
Sang-Seok Lee, *Tottori University, Japan*
Ryutaro Maeda, *Xi'an Jiaotong University, China*

In this session, we focus on sensors for animals to monitor health status or to diagnose diseases. Recently, interest on animal rights is growing and the number of pets is increasing world widely. Moreover, gas emission from livestock became a hot issue to keep social sustainability. Sensing animals' behavior or health status is very important issue to not only animal itself but also human beings. Presenting sensors for natural animals, zoo animals, livestock, fishes or pets, sharing ideas and giving new inspirations to sensor community is the purpose of this session. All about sensors such as bio/chemical sensors and mechanical sensors for animal are welcome. Besides sensor itself, big data treatment, interfaces, circuits regarding animal sensors are also topics in this session.

Microplastic Sensors: Emerging Approaches for Rapid and Portable Solutions
Selim Hanay, *Bilkent University, Türkiye*
Yegan Erdem*, Bilkent University, Ankara, Turkey*

Microplastic Pollution is increasingly recognized as an important health and environmental problem. Unfortunately, techniques traditionally used for microplastic analysis are slow, high-cost and non-portable. To address the need for rapid, low-cost and portable microplastic analyzers, different sensor approaches based on electronic, thermal and rheological properties of microplastics are being investigated. This focus section aims to bring together researchers, policy-makers and industrial partners to provide a timely update on emerging techniques for microplastic detection.

Electromagnetic Sensing and Communication for Biomedical and Industrial Applications
Olga Korostynska, *Oslo Metropolitan University, Oslo, Norway*
Mohammad Zarifi, *The University of British Columbia, Canada*

As wireless technology advances, electromagnetic (EM) and radio frequency (RF) sensing and communication are revolutionizing health parameters monitoring, industrial processes optimization and data connectivity all over the world. This session explores how cutting-edge EM/RF sensing and communication technologies are shaping the future of medical diagnostics and rehabilitation, wearable health devices, smart manufacturing approaches with real-time process optimisation, as well as advanced robotics and industrial automation. Integrated sensing and communications (ISAC) are becoming a tangible reality with continuous advancements in 5G and the future of 6G capabilities that will lead to advanced resource-efficient solutions. New breakthroughs in high-frequency communication, mmWave/THz frequencies hardware, intelligent surfaces, and advanced materials are unlocking faster, more precise, and more reliable sensing and communication solutions. Whether it is real-time health monitoring, non-invasive medical imaging, or ultra-efficient industrial systems, including gaming, rehabilitation and robotics, the interaction between EM waves and materials is key to groundbreaking innovations. Join leading researchers and industry experts as they showcase the latest advancements in EM/RF sensing and communication, smart materials, AI-driven sensor data processing, and next-generation connectivity.

SENSORPRENEUR PITCH

Finals @ SENSORS 2025 | 17:00-19:00 | Monday, October 20 | Parq Grand Ballroom – Refreshments will be provided; all are welcome!

This competition is to motivate young students/researchers to develop entrepreneurial and business mindsets with their skills and training on sensor research and development. This competition will allow the shortlisted candidates to get mentored to evolve their idea into product towards commercialization.

Top 5 Finalists

- Kuan-Yu Chen, University of Wisconsin-Madison
- Vedika Jakate, Indian Institute of Science Education and Research, Bhopal
- Mercy Otuko, Dedan Kimathi University of Technology
- Jonathan Rabe, North Carolina State University
- Rourke Sylvain, Michigan Technological University

Top 10 Finalists

- Anna Anandita, Indian Institute of Technology
- Rasool Baghbani, Department of Biomedical Engineering, Hamedan University of Technology, Hamedan, Iran
- Kuan-Yu Chen, University of Wisconsin-Madison
- Vedika Jakate, Indian Institute of Science Education and Research, Bhopal
- Chiara Micheli, University of Genova
- Mercy Otuko, Dedan Kimathi University of Technology
- Jonathan Rabe, North Carolina State University
- Rourke Sylvain, Michigan Technological University
- Uzay Tefek
- Xingyu Wang, University of Connecticut

Competition Rules

- One-page proposal should be submitted on or before April 30th , 2025. The proposal should include a Proposal Title, the Problem, Solution(s), and Expected Outcomes.
- The judging and mentoring panel will consist of entrepreneurs and industry experts who will first short list ten candidates from the submissions.
- The ten candidates will be mentored to understand the market potential of their idea, guidance towards pitch talk, understanding of budgeting and financial resources amongst others. This will be from May to August 2025.
- August 4, 2025: The ten candidates will be required to submit to the panel their improved proposal (6-slides worked out pitch) including market survey and plans to commercialize.
- August 18, 2025: the panel of experts will further shortlist the ten candidates to 5 finalists who will be asked to attend the Sensors Conference 2025 at Vancouver Canada and deliver the 10 minutes pitch talk to the panel of experts.

MYOSA STUDENT COMPETITION

17:00-18:00 | Sunday, October 19 | Prefunction Area

Welcome to the IEEE International MYOSA Event!

What is the aim of this competition?

It aims to excite submissions of innovative ideas, followed by live demonstrations of working prototypes in the flagship conferences of the IEEE Sensors Council. Some of the examples of the project proposals are given below:

- Automated lighting system of a smart housing
- Diagnostic applications based on a gesture sensor
- Automated irrigation for smart agriculture

What is the prize?

The top two teams will be awarded $200 (1st place) and $100 (2nd place). In case of a tie, $300 will be divided equally among the top teams.

All participating teams (selected for live demonstration) will receive a Participation Certificate.

These Awards will be given to the two best projects/teams at the IEEE Sensors 2025 conference award ceremony.

WISE PANEL

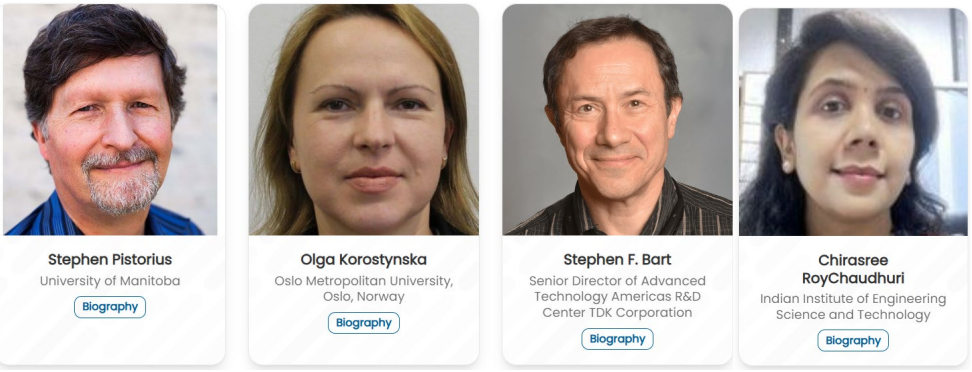
14:30-16:00 | Monday, October 20 | Kitsilano D

Addressing Blind Spots – Interdisciplinary Perspectives in Sensor Innovation

Join us for a thought-provoking panel discussion that explores the often-overlooked dimensions of sensor innovation. This session brings together experts from diverse fields to challenge conventional narratives and spotlight critical, yet underexplored, aspects such as digital inclusion, global equity, inclusive design, and the broader societal impact of sensing technologies. Attendees will gain valuable insights into how interdisciplinary thinking can unlock new pathways in technology development and deployment.
Don't miss this opportunity to engage with pioneering voices shaping the future of sensor systems for a more inclusive and impactful tomorrow.
Organizers:

- Dr. Paola Saccomandi, Politecnico di Milano, Italy
- Dr. Anwesha Khasnobish, TCS Research, India
- Dr. Arezoo Emadi, University of Windsor, Canada

PANELISTS



PROFESSIONAL HEADSHOTS

SENSORS 2025 is pleased to offer complimentary professional headshots to all attendees. This is your chance to get a polished, high-quality photograph perfect for your LinkedIn profile, company website, or next presentation.

Don't miss this valuable, free opportunity to look your best!

Location and Schedule
The headshot station will be located in the **Pre-Function Area** of the conference, and is available on a first-come, first-served basis.

Date	Time Slots
Monday, October 20, 2025	10:00 AM - 10:30 AM 2:30 PM - 4:00 PM
Tuesday, October 21, 2025	9:30 AM - 10:00 AM 2:30 PM - 4:30 PM 5:00 PM - 7:00 PM
Wednesday, October 22, 2025	10:00 AM - 10:30 AM 2:30 PM - 4:30 PM

Your professional headshot image will be shared with all conference attendees via a Google Drive link sent to the email address you used for registration.
If you prefer not to have your professional headshot included in the shared folder emailed to all attendees, please notify the **Conference Manager**.

SOCIAL EVENTS

WELCOME RECEPTION

Don't miss the Welcome Reception at IEEE SENSORS 2025 — a perfect chance to connect, relax, and kick off the conference in style!

Sunday | October 19, 2025 | 18:00 – 20:00

Location: JW Marriott Parq Vancouver, Parq Salon D,E,F

WISE NETWORKING LUNCH

The WiSe Networking lunch will be held in parallel with the WiSe Panel on "Addressing Blind Spots – Interdisciplinary Perspectives in Sensor Innovation" with reserved tables.

This event aims to provide a welcoming space for the sensor community to share their experiences and diverse perspectives to enhance sensor innovation and equity outcomes. It is the opportunity to meet colleagues from all over the word and different communities who share similar values.

Tuesday | October 21, 2025 | 12:00-13:00

Location: JW Marriott Parq Vancouver, Parq Grand Ballroom

CAREER FAIR

The 2025 IEEE SENSORS organizing committee is excited to announce our inaugural SENSORS Career Fair. The Career Fair will offer space and time for potential job seekers and companies to interact and connect. The Career Fair will take place on Tuesday at 5:00 PM at the conference venue. Drinks and appetizers will be provided through sponsorship by the IEEE Sensors Council Industrial Liaison Committee.

For Participants: Get your resumes/CVs ready! At registration, you'll be able to confirm your interest in attending the Career Fair. With this option, you can also upload your resume/CV, which may be shared with companies, given your permission.

All exhibitors and other companies who purchased a career fair table will be available at the career fair.

Tuesday | October 21, 2025 | 17:00-19:00

Location: JW Marriott Parq Vancouver, Prefunction Area

CONFERENCE DINNER

The Conference Dinner will be held in the Parq Grand Ballroom. The dinner is included in the full student and non-student conference registration fees - you can purchase a guest ticket for your +1 to attend this event via the conference registration site. One-Day or Tutorial/Workshop ONLY Registrations do NOT include the dinner. IEEE Sensors Journal will be celebrating its 25th anniversary at this dinner.

Tuesday | October 21, 2025 | 19:00 – 21:30

Location: JW Marriott Parq Vancouver, Parq Grand Ballroom

PROGRAM AT A GLANCE

**Full Conference Registrations (IEEE Member, Society Member, Non-Member, Student Member, Student Non-Member) allow you to attend all sessions on the schedule below.*

PDT	Sunday, October 19	Monday, October 20	Tuesday, October 21	Wednesday, October 22
8:00-8:30			Poster Session (Prefunction Area)	
8:30-9:30	Pre-Conference Tutorials/Workshops **For an additional fee - not included in main conference registration*	Opening Session/Plenary: Dr. Lakshminarayanan Mahadevan (Parq Grand Ballroom)		Poster Session (Prefunction Area)
9:30-10:00			Coffee Break (Prefunction Area)	
10:00-10:30		Coffee Break (Prefunction Area)	IEEE/SC Announcement & Keynote: Dr. Xiaoyi Bao (Parq Grand Ballroom)	Coffee Break (Prefunction Area)
10:30-12:00		Technical Sessions		Keynote: Dr. Chengkuo Lee & IEEE Sensors Council Awards (Parq Grand Ballroom)
12:00-13:00		Lunch (Parq Grand Ballroom)	Lunch/WiSe Networking Lunch (Parq Grand Ballroom)	Lunch (Parq Grand Ballroom)
13:00-14:30		Technical Sessions	Technical Sessions In-Conference Workshop (Fairview III & IV; 13:00-15:00): Generative AI Applied to Sensor Technology	Technical Sessions
14:30-16:00		WiSe Panel (Kitsilano D) Coffee/Posters (Prefunction Area)	Coffee/Posters (Prefunction Area)	Coffee/Posters/Live Demos (Prefunction Area)
16:00-17:00		Technical Sessions	Technical Sessions In-Conference Workshop (Fairview III & IV; 15:30-18:00): Generative AI Applied to Sensor Technology	Closing & Conference Awards (Parq Grand Ballroom)
17:00-18:00	MYOSA Student Competition (Prefunction Area)	YP Reception/Sensorpreneur Pitch (Prefunction/Parq Grand Ballroom) **Drinks and light hors d'oeuvres provided for all full conference registrants*	Industry Career Fair (Prefunction Area) **Drinks and light hors d'oeuvres provided for all full conference registrants*	
18:00-19:00	Welcome Reception (Parq Salon D, E, F) **Drinks and light hors d'oeuvres provided for all full conference registrants*			
19:00-20:00			Gala Dinner + Sensors Journal Anniversary Celebration (Parq Grand Ballroom) **Drinks and dinner provided for all full conference registrants*	
20:00-21:30				

10:30-12:00
Sensor Systems 1
Session Chair: Jinghao Yang
Room: Kitsilano A

10:30
5738: A High Performance Detector Based on HPHT-Diamond for Dosimetry of Ultrahigh Dose-Rate Electron Beams
Sara Pettinato{2}, Giulia Sinisi{3}, Marco Girolami{1}, Maria Cristina Rossi{3}, Stefano Salvatori{2}
{1}CNR - Consiglio Nazionale delle Ricerche, Italy; {2}Università degli Studi Niccolò Cusano, Italy; {3}Università degli Studi Roma Tre, Italy

10:45
5748: A Precision Low-Phase-Noise QCM Sensor Driving System with Parasitic Capacitance Compensation Technique
Hyungseup Kim{3}, Gibae Nam{1}, Manhyuck Choi{1}, Jaesung Kim{4}, Nam Ho Bae{2}, Hyoungho Ko{1}
{1}Chungnam National University, Korea; {2}National Nanofab Center, Korea; {3}Samsung Display Co., Ltd., Korea; {4}Samsung Electronics Co., Ltd., Korea

11:00
5767: Video-Rate Fluorescence Lifetime Imaging System Using a Novel Switched Capacitor QVGA SPAD Sensor
Wannes Nevens, Thomas Lapauw, Jonathan Vrijsen, Thomas Van Den Dries, Hans Ingelberts, Maarten Kuijk
Vrije Universiteit Brussel, Belgium

11:15
5799: A Quantitative Sputtering Method for Accurate Composition Calibration of 2.5 µm Thin Au-Sn Metallization Enabling WLP Slid Bonding
Jianjun Ma, Qi Wei, Bin Zhou, Rong Zhang
Tsinghua University, China

11:30
5800: TF-RHYTHMM: Time-Frequency Ridge Based Heart Rate Estimation Yielded Through Mode Matching for MIMO Radar
Naoki Honma, Kentaro Murata, Morio Iwai, Koichiro Kobayashi
Iwate University, Japan

11:45
5806: High-Performance Acoustofluidic Platform for Hematocrit Determination and Particle Separation Using Lateral Plate Transducer Modes
Andreas Fuchsluger{2}, Tina Mitteramskogler{1}, Rafael Ecker{2}, Annalisa De Pastina{3}, Bernhard Jakoby{1}
{1}Institute for Microelectronics and Microsensors, Johannes Kepler University Linz, Austria; {2}Johannes Kepler University Linz, Austria; {3}Silicon Austria Labs GmbH, Austria

10:30-12:00
Sensing Applications
Session Chair: Enrico Alessi
Room: Kitsilano B

10:30
5224: Towards Developing Frequency Robustness via Domain Enriched AI for Industrial Metal Detection
Suhrid Das{1}, Ankit Tyagi{1}, Vishal Monga{2}
{1}Eriez Manufacturing, United States; {2}Pennsylvania State University, United States

10:45
5728: Electronic Nose Based on MEMS Sensors for Non-Invasive Detection of Colorectal Cancer via Breath Profiling
Cristhian Manuel Duran Acevedo{2}, Jeniffer Katerine Carrillo Gomez{2}, Omar Geovanny Perez Ortiz{1}, Marcel Leonardo Quintero Contreras{3}, Gustavo Adolfo Bautista Gomez{2}
{1}GIEPATI Group, University of Pamplona, Colombia; {2}GISM Group, University of Pamplona, Colombia; {3}VESALIUS Group, University of Pamplona, Colombia

11:00
5732: Machine Learning-Driven Compensation for Non-Ideal Channels in AWG-Based FBG Interrogator
Ivan Kazakov{2}, Iana Kulichenko{2}, Egor Kovalev{2}, Angelina Treskova{2}, Daria Barma{2}, Kirill Malakhov{2}, Arkady Shipulin{1}
{1}Skolkovo Institute of Science and Technology, Russia; {2}Skolkovo Institute of Science and Technology / Fiber Pipe LLC, Russia

11:15
5741: Machine Learning Based Ball Size Monitoring in Ball Mill Using Novel Mode and Feature Selection Methods Over Beamformed Audio
Mayukh Biswas{2}, Amit Swain{3}, Raj Rakshit{2}, Chirabrata Bhaumik{3}, Subhrajit Das{1}, Govindha Pavan Tati{1}, Arun Kumar Majumder{1}
{1}Indian Institute of Technology Kharagpur, India; {2}Tata Consultancy Services Limited, India; {3}TCS Research, Tata Consultancy Services, India

11:30
5747: Innovative Sensor Systems Using Deep Learning and Piezoelectric Resonators for Biofuel Monitoring
Víctor Corsino, Víctor Ruiz-Díez, José Luis Sánchez-Rojas
Universidad de Castilla-La Mancha, Spain

11:45
5750: Localization of Embedded Sensors in Reinforced Concrete via Time-Series Magnetic Field Sensing and Maximum Likelihood Estimation
Ryosuke Sada, Toshihisa Tanaka, Hisafumi Asaue, Tomoki Shiotani, Masanori Hashimoto, Ryo Shirai
Kyoto University, Japan

10:30-12:00
Sensors in Industrial Practices 1
Session Chairs: Sara Pellegrini, José Luis Sánchez de Rojas Aldavero
Room: Kitsilano C

10:30
5651: Real-Time Monitoring of Molten Cryolite Composition Using a Resonant Capacitive Sensor
Fakhreddin Amirhosseini, Abid Ali, Behraad Bahreyni
Simon Fraser University, Canada

10:45
5518: Radial Shaft Misalignments Measured by a Sensor-Integrating Jaw Coupling
Arthur Ewert{1}, Johannes D. M. Menning{1}, Thomas Rosenlöcher{1}, Artem Prokopchuk{1}, E.-F. Markus Vorrath{1}, Thomas Wallmersperger{2}, Berthold Schlecht{1}
{1}Dresden University of Technology, Germany; {2}Technische Universität Dresden, Germany

11:00
5159: A Novel Vision-Based Method for Accurate Tool Center Point Calibration of Robots
Roman Haas{1}, Thomas M. Wendt{2}
{1}Hochschule Offenburg, Germany; {2}Work-Life Robotics Institute, Hochschule Offenburg / University of Applied Sciences Offenburg, Germany

11:15
5419: A Novel Digital Twin Driven Multi-Camera Edge Computing Sensing System for Additive Manufacturing
Martha Asare, Joel Mathew, Efren Saenz, Hongkai Yu, Jinghao Yang
University of Texas Rio Grande Valley, United States

11:30
5795: Hybrid CIS+EVS Sensor for Industrial Application (INVITED)
Bo Mu
Omnivision Technologies Inc, United States

10:30-12:00
Data Processing & AI for Industrial Applications 1
Session Chairs: André Lazzaretti, Deran Maas
Room: Kitsilano D

10:30
5759: Trends in High-Resolution Sensor Data Processing and AI for Power Grid Monitoring and Intelligence (INVITED)
Farnoosh Rahmatian
NuGrid Power Corp, Canada

11:00
5727: Development of an Edge Device to Detect Positioning Anomalies in Industrial Robots
Willian Andrade{3}, Bruna Mulinari{1}, Carlos Costa{3}, Clayton Costa{1}, Ricardo Kondo{2}, André Eugenio Lazzaretti{4}
{1}Dataplai, Brazil; {2}Pontificia Universidade Católica do Paraná, Brazil, Brazil; {3}Robert Bosch GmbH, Brazil; {4}Universidade Tecnológica Federal do Paraná, Brazil

11:15
5392: A Semi-Supervised Lightweight GAN-Based Method for Weld Defect Recognition in Industry
Rodrigo Minetto{2}, André Bicalho{3}, Sylvio Block{3}, Marco Teixeira{1}, Ricardo Silva{2}, André Eugenio Lazzaretti{2}
{1}PPGIa, Pontificia Universidade Católica do Paraná, Brazil, Brazil; {2}Universidade Tecnológica Federal do Paraná, Brazil; {3}UTFPR/CPGEI, Brazil

11:30
5162: LiDAR-Guided Gaussian Splatting for Ship-to-Shore Crane Automation
Yihan Wang, Josip Marjanovic, Stefano Maranò, Deran Maas
ABB Switzerland Ltd, Switzerland

11:45
5689: Sensitivity-Aware Transformer for Robust Compressor Fault Detection in Natural Gas Pipelines
Khadija Shaheen{1}, Apoorva Chawla{1}, Ferdinand Uilhoorn{2}, Pierluigi Salvo Rossi{1}
{1}Norwegian University of Science and Technology, Norway; {2}University of Warsaw, Poland

10:30-12:00
Sensor Networks & IoT 1
Session Chairs: Sebastian Bader, Brendan O'Flynn
Room: Fairview I & II

10:30
5809: Smart Sensors and Systems for Sustainable Agriculture, Food & Environmental Applications (INVITED)
Alan O'Riordan, Shane O'Sullivan, Md Ridwan Adib
Tyndall National Institute, Ireland

11:00
5154: Propagation-Aware Node Selection for GNN-Based Kriging in Resource-Constrained Wireless Sensor Networks
Jingtong Yao, Yansong Du, Yuting Zhou, Feiyu Jiao, Xun Guan
Tsinghua University, China

11:15
5316: Every Microjoule Counts: Zero-Failure Task Execution in Batteryless Sensors
Matteo Nardello, Maria Doglioni, Simone Dagnino, Patrick Pastorelli, Davide Brunelli
Università degli Studi di Trento, Italy

11:30
5546: Enhanced Energy-Aware LoRaWAN Scheduler for Intermittent Sensor Systems
Domenico Balsamo{1}, Fatma Benkhelifa{2}, Sergey Mileiko{1}, Firdaus Ritom{1}
{1}Newcastle University, United Kingdom; {2}Queen Mary University of London, United Kingdom

11:45
5617: Channel Selective Bluetooth Low Energy (BLE) Backscatter from Wireless Sensor Devices Using Bulk Acoustic Wave (BAW) Filters
Kevin Ho, Matthew Reynolds
University of Washington, United States

10:30-12:00
Chemical, Electrochemical & Gas Sensors 1
Session Chairs: Hamida Hallil, Jeong-O Lee
Room: Fairview III & IV

10:30
5745: Advancing Drone-Based Odour Monitoring in Wastewater Treatment Plants (INVITED)
Santiago Marco
Institute for Bioengineering of Catalonia, Spain

11:00
5094: Scent Creation with an Olfactory Display Based on a Odor Generative Diffusion Algorithm
Manuel Aleixandre{2}, Hiroki Tanabe{2}, Dani Prasetyawan{1}, Takamichi Nakamoto{2}
{1}Honda Motor Co., Ltd., Japan; {2}Institute of Science Tokyo, Japan

11:15
5227: Common Reference Potetiostat for Reducing Interference in Simultaneous Multi-Technique Electrochemical Arrays
Samuel Lobert, Derek Goderis, Ehsan Ashoori, David Hickey, Navid Yazdi, Andrew Mason
Michigan State University, United States

11:30
5618: Performance Evaluation of Insect Electroantennography-Based Bilateral Sensors for Mobile Odorant Sensing
Yuji Sukekawa, Jeongmin Lee, Takuya Nakajo, Ryohei Kanzaki, Hidefumi Mitsuno
University of Tokyo, Japan

11:45
5445: Evaluation of Electrical Property Changes in Odor-Sensitive Membranes Upon Gas Exposure for CMOS Odor Sensor Applications
Yoshihiro Asada, Ik-Hyun Kwon, Yong-Joon Choi, Kazuhiro Takahashi, Kazuaki Sawada, Toshihiko Noda
Toyohashi University of Technology, Japan

10:30-12:00
Sensing Systems
Session Chair: Mark Cheng
Room: Fairview V

10:30
5769: Parking Occupancy Detection Through Adaptive Multi-Sensor Camera-CNN Fusion
Vincent Lassen, Maximilian Lübke, Norman Franchi
Institute for Smart Electronics and Systems, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

10:45
5776: Wrist-to-Back Signal Reconstruction for Real-World Gait Monitoring via Frequency-Domain Modelling
Shimaa Aboudeif, Shahab Alizadeh, Sayeh Bayat
University of Calgary, Canada

11:00
5786: Automated Vision-Based Detection of Impairment Through Divided Attention Psychophysical Tests
Saboora M. Roshan, Edward J. Park
Simon Fraser University, Canada

11:15
5794: Unsupervised Anomalous Sound Detection in Industrial Machine Facilities
Christof Pichler{1}, Markus Neumayer{1}, Christoph Feilmayr{2}, Stefan Schuster{2}, Hannes Wegleiter{1}
{1}Graz University of Technology, Austria; {2}voestalpine Stahl GmbH, Austria

11:30
5803: Reinforcement Learning Based Autonomous UAV Navigation for CO Source Localization
Pritika Marik, Harshit Kumar Sahu, Chiranjib Ghosh, Amit Ruidas, Soumajit Pramanik, Avishek Adhikary
Indian Institute of Technology Bhilai, India

11:45
5807: An Intelligent Camera-Based Contactless Driver Stress State Monitoring Using Multimodality Fusion
Swarubini P J{1}, Thomas M. Deserno{2}, Nagarajan Ganapathy{1}
{1}Indian Institute of Technology Hyderabad, India; {2}Peter L. Reichertz Institute for Medical Informatics of TU Braunschweig and Hannover Medical School, Germany

10:30-12:00
Physical Sensors 1
Session Chair: Ensieh Hosseini
Room: Granville

10:30
5754: Design and Optimization of Micro Pirani Gauges (INVITED)
Yi Chiu{2}, Manu Garg{2}, Pushpapraj Singh{1}
{1}Indian Institute of Technology Delhi, India; {2}National Yang Ming Chiao Tung University, Taiwan

11:00
5027: A Highly Durable MEMS Hydrogen Pressure Sensor for Fuel Cell Systems Using Atomic Layer Deposited Al2O3 / Parylene-C Hybrid Barrier Coating
Eiji Yoshikawa, Naoki Morinaga, Tsukasa Motoya, Sota Umetani, Hisaaki Ito
Mitsubishi Electric Mobility Corporation, Japan

11:15
5075: Precision Temperature Sensing and Digital Control for Microheating Platforms
Navid Yazdi{1}, Weibin Zhu{2}, Andrew Mason{1}, Lucas Wolstencroft{1}
{1}Michigan State University, United States; {2}W&F Technologies, LLC, United States

11:30
5386: A Novel Sapphire-Based MEMS Wall Shear Stress Sensor with Remarkable Thermal Endurance Up to 800℃
Yunzhe Liu, Yunjian Chen, Shengming Ma, Chuqiao Wang, Wenlong Wang, Tao Zhang, Yuanying Zhang, Xingxu Zhang, Binghe Ma
Northwestern Polytechnical University, China

11:45
5563: Force Sensors Based on Optomechanical Cavities Made from Silicon Nanopillars
Daniel Navarro-Urrios{2}, Martin Poblet{2}, David Alonso-Tomás{2}, Elena López-Aymerich{1}, Christian Vinther Bertelsen{1}, Rahul Singh{1}, Sergi Hernandez{2}, Maria Dimaki{1}, Winnie Edith Svendsen{1}, Juliana Jaramillo-Fernández{3}, Mauricio Moreno-Sereno{2}, Albert Romano-Rodriguez{2}
{1}Technical University of Denmark, Denmark; {2}Universitat de Barcelona, Spain; {3}Universitat Politècnica de Catalunya, Spain

10:30-12:00
Ultrasonic Sensors
Session Chair: Arezoo Emadi
Room: Cambie

10:30
5779: Development, Characterization, and Performance Enhancement of CMOS-MEMS Dual-Gap Capacitive Ultrasound Transducers
Kuan-Yi Lu{1}, Chang-Lin Hu{1}, Chien-Ju Li{1}, Hung-Yu Chen{3}, Sheng-Shian Li{2}
{1}Industrial Technology Research Institute, Taiwan; {2}National Tsing Hua University, Taiwan; {3}University of California, Berkeley, Taiwan

10:45
5785: Tracking Muscle Stiffness During Gripping with Wearable Ultrasound Shear-Wave Elastometry
Shane Steinberg, Yuu Ono, Sreeraman Rajan
Carleton University, Canada

11:00
5804: Bi4Ti3O12-Based sol-Gel Composite Ultrasonic Transducer for high-Temperature Measurements
Mako Nakamura, Makiko Kobayashi
Kumamoto University, Japan

11:15
5885: Calorimetric Monitoring of Exothermic Reaction by Distributed Acoustic Sensing
Yannik Schick{2}, Guilherme Heim Weber{4}, Robin Hohensinn{3}, Danilo F. Gomes{1}, Cicero Martelli{4}, Mark W. Hlawitschka{3}, Marco J. Da Silva{3}
{1}Federal University of Technology-Paraná, Brazil; {2}Institute of Measurement Technology, Johannes Kepler University Linz, Austria; {3}Johannes Kepler University Linz, Austria; {4}Universidade Tecnológica Federal do Paraná, Brazil

11:30
5921: A Miniature, Broadband Focused PVDF-TrFE PMUT with Interface ASIC for High-Resolution IVUS Imaging
Ruiyan Wang{1}, Dave Dudzinski{2}, Russell Fedewa{2}, Aaron Fleischman{2}, Steve Majerus{1}
{1}Case Western Reserve University, United States; {2}Cleveland Clinic Lerner Research Institute, United States

11:45
5879: A Polyvinyldene Fluoride - 28 nm CMOS Active Ultrasound Sensor for the Experimental Measurement of Proton Beam Range in Hadron Therapy
Elia Arturo Vallicelli{4}, Lorenzo Stevenazzi{4}, Saadat Ali{3}, Andrea Baschirotto{4}, Mario Ciocca{2}, Alessandro Michele Ferrara{1}, Maurizio Marrale{5}, Marco Pullia{2}, Mara Severgnini{1}, Mattia Tambaro{4}, Marcello De Matteis{4}
{1}Azienda Sanitaria Universitaria Giuliano Isontina - ASUGI, Italy; {2}Centro Nazionale Di Adroterapia Oncologica CNAO, Italy; {3}Istituto Universitario di Studi Superiori IUSS, Italy; {4}Università degli Studi di Milano-Bicocca, Italy; {5}Università degli Studi di Palermo, Italy

13:00-14:30
Optical Sensors 1
Session Chairs: Michiko Nishiyama, Sadra Tafaghodi Jami
Room: Kitsilano A

13:00
5743: Optical Fibre Sensors for Healthcare Applications: From Fundamental Science to Clinical Trials (INVITED)
Sergiy Korposh{2}, Seung-Woo Lee{1}, Ricardo Correia{2}, Barrie Hayes-Gill{2}, Steve Morgan{2}
{1}University of Kitakyushu, Japan; {2}University of Nottingham, United Kingdom

13:30
5020: A 120dB Dynamic Range CMOS Image Sensor with Dual Programmable Conversion Gains and Pixelwise QCG Modulation for Single-Frame Adaptive QCG-HDR Imaging
Yi Luo{2}, Shahriar Mirabbasi{1}
{1}University of British Columbia, Canada; {2}vivo Mobile Communication Co., Ltd., China

13:45
5135: Calibration Method for Multi-Spectral Par Sensor
Johannes Klueppel{1}, Clara Stock{1}, Christiane Werner{1}, Laura Maria Comella{2}
{1}Albert-Ludwigs-Universität Freiburg, Germany; {2}Hochschule Karlsruhe - HKA, Germany

14:00
5357: Towards a Fully Integrated Refractometric Sensor in Silicon Nitride: Integrated Spectrometer Design
Asih Setiarini{5}, Olivier Bernal{4}, Clément Deleau{6}, Mohamad Syahadi{5}, Francis Jayat{2}, James Sharp{7}, Frederic Surre{7}, Franck Carcenac{1}, Christophe Caucheteur{8}, Philippe Arguel{3}, Han-Cheng Seat{4}
{1}LAAS-CNRS, France; {2}LAAS-CNRS, Toulouse INP, France; {3}LAAS-CNRS, University of Toulouse, France; {4}LAAS-CNRS, University of Toulouse, Toulouse INP, France; {5}LAAS-CNRS, University of Toulouse, Toulouse INP, National Research and Innovation, France; {6}Nanoscale Quantum Photonics Laboratory, RIKEN Cluster for Pioneering Research, Saitama, 351-0198, JA, Japan; {7}University of Glasgow, United Kingdom; {8}University of Mons, Belgium

14:15
5509: Integration and FOV Characterization of an All Silicon Microlens Array for Temperature Detection
Francesca Grossi{1}, Silvia Nicoli{2}, Giuseppe Bruno{2}, Lorenzo Tentori{2}, Andrea Ivano Melloni{1}, Francesco Morichetti{1}
{1}Politecnico di Milano, Italy; {2}STMicroelectronics, Italy

13:00-14:30
Sensor Fusion with Time Synchronization
Session Chairs: Motoaki Hara, Yoshikazu Hirai
Room: Kitsilano B

13:00
5306: Atomic Clocks Based on Hot Alkali Vapor Microfabricated Cells
Rodolphe Boudot{2}, Nicolas Passilly{2}, Vincent Maurice{1}, Emmanuel Klinger{2}, Quentin Tanguy{2}, Carlos-Manuel Rivera-Aguilar{2}, Clément Carlé{2}, Moustafa Abdel Hafiz{2}, Andrei Mursa{2}
{1}Centrale Lille / IEMN, France; {2}FEMTO-ST Institute, France

13:30
5039: Interferometric Evaluation of MEMS-Tunable VCSEL Stability for Chip Scale Atomic Clocks
Vivek Anand Menon{3}, Mohammed Saad Khan{2}, Shutaro Ishida{2}, Keiji Isamoto{2}, Nobuhiko Nishiyama{1}, Hiroshi Toshiyoshi{3}
{1}Institute of Science Tokyo, Japan; {2}Santec Corporation, Japan; {3}University of Tokyo, Japan

13:45
5482: Metasurface-Minituarized MEMS Vapor Cell for Advanced Time Synchronization
Kentaro Iwami, Yuto Kataoka, Prutphongs Ponrapee
Tokyo University of Agriculture and Technology, Japan

14:00
5174: Demonstrator for Consensus-Based Time Synchronization Based on Dynamic Consensus
Andreas Bathelt, Ferran Valdes Crespi, Santiago Pérez Pérez
Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR, Germany

13:00-14:30
Emerging Applications
Session Chair: Navid Yazdi
Room: Kitsilano C

13:00
5737: Flexible Self-Powered X-Ray Detectors Based on Wide-Bandgap Metal-Halide-Perovskite Submicrometric Thin Films
Marco Girolami{1}, Fabio Matteocci{4}, Farshad Jafarzadeh{2}, Sara Pettinato{3}, Valerio Serpente{1}, Antonello Ranieri{1}, Stefano Salvatori{3}, Aldo Di Carlo{1}, Daniele Maria Trucchi{1}
{1}CNR - Consiglio Nazionale delle Ricerche, Italy; {2}Università degli Studi di Roma Tor Vergata, Italy; {3}Università degli Studi Niccolò Cusano, Italy; {4}Unversità degli Studi di Roma Tor Vergata, Italy

13:15
5810: Feasibility Study and Preliminary Testing of 3D Printing on ASICs for MEMS: a Particulate Sensor Case Study
Gaspare Santaera{1}, Andrea Ottomaniello{2}, Marina Galliani{1}, Luca Maggi{3}, Marco Del Sarto{3}, Amedeo Maierna{3}, Giuseppe Bruno{3}, Francesco Greco{1}, Virgilio Mattoli{2}, Cesare Stefanini{1}
{1}Istituto di Biorobotica, Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna, Italy; {2}Istituto Italiano di Tecnologia, Italy; {3}STMicroelectronics, Italy

13:30
5816: Enabling the Refractive Index Modulation of Vision-Correcting Smart Contact Lens Utilizing an Optimized Design of Relay-Assisted Wireless Power Transfer
Khandaker Reaz Mahmud, Seungbeom Noh, Ashrafuzzaman Bulbul, Carlos Mastrangelo, Hanseup Kim
University of Utah, United States

13:45
5854: Highly Sensitive Capacitive Tilt Sensor Using Liquid Metal Movable Electrode
Jinwon Jeong{1}, Muhammad Luqman Haider{2}, Tanzila Noushin{1}, Yun Ting Hsia{1}, Jeong Bong Lee{1}
{1}Baylor University, United States; {2}University of Texas at Dallas, United States

14:00
5857: Estimating Movement Direction from Body Orientation Using Dual Ultra-Wideband Sensor Configuration
Amir Shahbazi Ojghaz, Sayeh Bayat, Farnaz Sadeghpour
University of Calgary, Canada

14:15
5892: Novel Microwave Sensor for Quality Assurance of Indoor Residual Spraying
Patryk Kot{3}, Magomed Muradov{4}, Andy Shaw{4}, Ghulam Mohi-Ud-Din{5}, Vijayakumar Karunamoothei{4}, Rinki Deb{6}, Asgar Ali{1}, Sadhana Sharma{1}, Prabhas Kumar Mishra{2}, Bikas Sinhad{2}, Rudra Pratap Singh{5}, Janet Hemingway{5}, Michael Coleman{5}
{1}All India Institute of Medical Sciences, India; {2}CARE India, India; {3}Infection Innovation Consortium iiCON, Liverpool School of Tropical Medicine, United Kingdom; {4}Liverpool John Moores University, United Kingdom; {5}Liverpool School of Tropical Medicine, United Kingdom; {6}Vestergaard Sarl, Switzerland

13:00-14:30
Data Processing & AI for Health Applications
Session Chair: Ashish Pandharipande
Room: Kitsilano D

13:00
5038: An Energy Efficient Regressive Spiking Neural Network for PPG-Based Blood Pressure Estimation
Yuxiang Cai, Yanhang Chen, Yifei Fan, Jie Yuan
Hong Kong University of Science and Technology, Hong Kong

13:15
5449: Unveiling Mental Workload via Ppg: Morphological and Respiratory Feature–Driven Machine Learning Classification
Marco Pogliano{1}, Gabriele Luzzani{2}, Alessandro Sanginario{1}, Giorgio Guglieri{1}, Danilo Demarchi{1}
{1}Politecnico di Torino, Italy; {2}University of Maryland, College Park, United States

13:30
5450: Data-Driven Conductivity Mapping for Tissue Margin Estimation with a Multi-Electrode Sensor Array
Zoltan Lovasz{2}, Carina Veil{3}, Matthias Ege{1}, Franziska Krauß{2}, Oliver Sawodny{2}
{1}Institute for System Dynamics, Universität Stuttgart, Germany; {2}Institute for System Dynamics, University of Stuttgart, Germany; {3}Stanford University, United States

13:45
5637: AI-Enabled Smart Hygiene System for Real-Time Glucose Detection
Khan Masood Parvez{1}, Sk Md Abidar Rahaman{3}, Ali Shiri Sichani{4}, Hadi Aliakbarpour{2}
{1}Aliah University, India; {2}Saint Louis University, United States; {3}University of Burdwan, India; {4}University of Missouri, United States

14:00
5349: Optimized Sensor Placement and Fusion of Optical and Electrical Modalities for Tissue Classification
Matthias Ege{2}, Elisabeth Grumann{2}, Franziska Krauß{3}, Zoltan Lovasz{3}, Andrea Rüdinger{1}, Carina Veil{4}, Oliver Sawodny{3}, Cristina Tarín{2}
{1}Institute for Applied Optics, Universität Stuttgart, Germany; {2}Institute for System Dynamics, Universität Stuttgart, Germany; {3}Institute for System Dynamics, University of Stuttgart, Germany; {4}Stanford University, United States

13:00-14:30
Emerging Sensor Technologies & Applications 1
Session Chairs: Bonnie Gray, Andrew Steckl
Room: Fairview I & II

13:00
5765: Towards Decentralized Diagnostics for Women's Health Using Silicon Photonic Integrated Circuits (INVITED)
Samantha Grist, Lauren Puumala, Karyn Newton, Mohammed Al-Qadasi, Maggie Wang, Myra Wei, Ben Cohen-Kleinstein, Sheri Chowdhury, Kithmin Wickremasinghe, So Jung Kim, Stephen Kioussis, Yuting Hou, Sajida Chowdhury, Avineet Randhawa, Matthew Mitchell, Lukas Chrostowski, Sudip Shekhar, Karen Cheung
University of British Columbia, Canada

13:30
5215: Development of Sensors and Optical Filters Towards Detecting Tissue Damage During Organ Transplants
Avik Sett{3}, Jeroen de Jonge{2}, Filippos Bersis{1}, Massimo Mastrangeli{1}, Paddy French{1}
{1}Delft University of Technology, Netherlands; {2}Erasmus Medical Centre, Netherlands; {3}SRM Institute of Science and Technology, India

13:45
5347: Non-Intrusive Plant Dynamic Monitoring Using mmWave Radar
Jorik De Bruycker{2}, Gilles Callebaut{2}, Thomas Reher{2}, Bram Van de Poel{2}, Uwe Maaß{1}, Nobby Stevens{2}
{1}Fraunhofer Institute for Reliability and Microintegration IZM, Germany; {2}Katholieke Universiteit Leuven, Belgium

14:00
5569: Thermal Characterization of Tactile E-Skin Based on Rayleigh Backscattering Optical Fiber
Daniele Moglia, Marian Statache, Andrea Ortone, Domenico Camboni, Tommaso Proietti, Mariangela Filosa, Calogero Maria Oddo
Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna, Italy

14:15
5398: A High-Precision and Large-Range Iontronic Flexible 3D Force Sensor for Robotic Interactions
Shichao An, Zhengang An, Dachao Li, Lei Zhang
State Key Laboratory of Precision Measuring Technology and Instruments, Tianjin University, China

13:00-14:30
Chemical, Electrochemical & Gas Sensors 2
Session Chairs: Hamida Hallil, Bérengère Lebental
Room: Fairview III & IV

13:00
5725: Dual-Oscillator NEMS Based Hydrogen Detection
Wenguang Jiang{3}, Monan Ma{3}, Hagen Gress{3}, Ismet Kaya{4}, Selim Hanay{2}, Kamil Ekinci{3}, Miguel Gonzalez{1}
{1}Aramco Research Center Houston, United States; {2}Bilkent University, Turkey; {3}Boston University, United States; {4}Sabanci University, Turkey

13:15
5521: Repealing the Responsivity to Selectivity-Compromise of Carbon Nanotube-Based Hydrogen Sensors by Polymer/Noble-Metal Functionalization
Simon Böttger{1}, Tobias Iffland{1}, Martin Hartmann{2}, Leticia Alves Da Silva{1}, Ray Saupe{2}, Sascha Hermann{1}
{1}Chemnitz University of Technology, Germany; {2}Fraunhofer Institute for Electronic Nano Systems ENAS, Germany

13:30
5310: Palladium-Coated Laterally Vibrating Resonators (LVRs) for Hydrogen Sensing
Gaia Giubilei, Farah Ben Ayed, Yvonne Sautriot, Aurelio Venditti, Kun Zhang, Sila Deniz Calisgan, Pietro Simeoni, Zhenyun Qian, Matteo Rinaldi
Northeastern University, United States

13:45
5304: Polydiacetylene-Based Sensor Development for Chemical Warfare Agent Detection
Philip Miller, Mieko Hirabayashi, Jessica McDow, Marieke Sorge, Maurice Payne, Clayton Curtis, William Corbin
Sandia National Laboratories, United States

14:00
5300: Advanced SAW Sensors Based on Nanocrystalline Graphite for Air Quality Monitoring
Angela Baracu, Marius Stoian, Octavian Simionescu, Cosmin Obreja, Valentin Buiculescu, Raluca Gavrila, Gabriel Craciun, Florin Comanescu
IMT Bucharest, Romania

14:15
5103: Tailoring Pd-Doped MoS2 Monolayers for Enhanced Hydrogen Sulfide Gas Sensing
Vikash Kumar Verma{2}, Chandrabhan Patel{1}, Poonam Bajoria{2}, Shaibal Mukherjee{2}
{1}Indian Institute of Information Technology Bhopal, India; {2}Indian Institute of technology Indore, India

13:00-14:30
Biosensors
Session Chair: Aida Ebrahimi
Room: Fairview V

13:00
5731: Ventricular Ectopic Beats Detection Using MEMS-Resonator-Based Reservoir Computer
Kosuke Shima, Hiroki Takemura, Masaki Shimofuri, Amit Banerjee, Jun Hirotani, Toshiyuki Tsuchiya
Kyoto University, Japan

13:15
5788: Automatic Characterization of Droplet Flow Regimes in Microfluidic T-Junctions Using Capacitive Sensing
Andreas Tröls, Nico Rathmayr, Marco Da Silva
Johannes Kepler University Linz, Austria

13:30
5791: Flexible Memristive Biosensors for Sensitive Detection of Prostate-Specific Antigen in Biological Environments (INVITED PRE-PUBLISHED JOURNAL PAPER)
Bajramshahe Shkodra{4}, Simone De Prà{2}, Antonio Altana{4}, Mattia Petrelli{4}, Moritz Ploner{4}, Martina Aurora Costa Angeli{3}, Luisa Petti{4}, Sandro Carrara{1}, Paolo Lugli{4}
{1}Bio/CMOS Interfaces Laboratory, École Polytechnique Fédérale de Lausanne, Switzerland; {2}Politecnico di Torino, Italy; {3}Sensing Technology Laboratory, Free University of Bozen-Bolzano, Italy; {4}Sensing Technology Laboratory, Libera Università di Bolzano, Germany; {4}Sensing Technology Laboratory, Libera Università di Bolzano, Italy

13:45
5853: A Microwave Sensor Based on Concentric Split-Ring Resonators for Blood Urea Detection: a Novel Tool for Chronic Kidney Disease Diagnosis (INVITED PRE-PUBLISHED JOURNAL PAPER)
Mateus Isaac de Oliveira Souza, Natália Mariana Dos Santos, Laudemir Carlos Varanda, Vinicius Marrara Pepino, Ben-Hur Viana Borges
Universidade de São Paulo, Brazil

14:00
5867: Force Sensitive Resistors for Detecting Peripheral IV Failure
Denise Wilson, Lorenzo Guio, Greg Valentine
University of Washington, United States

13:00-14:30
Microelectronic Sensor Systems
Session Chairs: Michael Sherburne, Mantalena Sarafianou
Room: Granville

13:00
5420: PMUT-Based Compound Imaging Using Transmit-Receive Sub-Aperture Beamforming
Gaia Giubilei{2}, Mantalena Sarafianou{1}, Duan Jian Goh{1}, Yul Koh{1}, Fabrizio Cerini{3}, Alberto Leotti{3}, Siow Pey Pea{3}, Jia Hwee Eng{3}
{1}IME, Agency for Science, Technology and Research, Singapore; {2}Politecnico di Torino, Italy; {3}STMicroelectronics, Italy; {3}STMicroelectronics, Singapore

13:15
5077: A High-Precision Phase Error Identification and Compensation Method for Full Symmetric MEMS Rate-Integrating Gyroscope Based on Virtual Control Force Observation
Bei Li, Zhuonan Li, Zihao Zhao, Bo Yang
Southeast University, China

13:30
5016: In-Sensor Computing with Contactless MEMS: Binary Neurons for Harsh Environment
Aleksandra Markovic{3}, Armine Karami{2}, Nicolas Mauran{3}, Philippe Basset{4}, Herve Fanet{1}, Bernard Legrand{3}, Gael Pillonnet{1}
{1}CEA-Leti, France; {2}CNRS ESYCOM, France; {3}CNRS LAAS, France; {4}ESIEE ESYCOM, France

13:45
5640: Investigation of Optimal Component Combinations for Odor Reproduction Based on Subtractive Mixing from Olfactory White
Riku Nomura{1}, Yuki Yoshida{1}, Ryusuke Chida{1}, Uta Nakashima{1}, Haruka Matsukura{2}, Hiroshi Ishida{1}
{1}Tokyo University of Agriculture and Technology, Japan; {2}University of Electro-Communications, Japan

14:00
5778: Bridging Chip Technology and Analytical Chemistry: Miniaturized Gas Chromatography (INVITED)
Masoud Agah
Virginia Polytechnic Institute and State University, United States

13:00-14:30
Sensing Systems 2
Session Chair: Swaminathan Rajaraman
Room: Cambie

13:00
5833: Sensor-Enabled Safety Systems for Human–Robot Collaboration: a Review (INVITED PRE-PUBLISHED JOURNAL PAPER)
Constantin Scholz{2}, Hoang-Long Cao{2}, Emil Imrith{2}, Nima Roshandel{2}, Hamed Firouzipouyaei{2}, Aleksander Burkiewicz{2}, Milan Amighi{2}, Sebastien Menet{2}, Dylan Warawout Sisavath{2}, Antonio Paolillo{2}, Xavier Rottenberg{1}, Peter Gerets{1}, David Cheyns{1}, Marcus Dahlem{1}, Ilja Ocket{1}, Jan Genoe{1}, Kathleen Philips{1}, Bram Vanderborght{2}
{1}IMEC, Belgium; {1}IMEC, Netherlands; {2}Vrije Universiteit Brussel, Belgium

13:15
5839: IoT-Based Indoor Thermal Comfort Prediction Using Multivariate Statistical Analysis (INVITED PRE-PUBLISHED JOURNAL PAPER)
Oumaima Afif{1}, Gaetano Ingenito{1}, Marco Bellomo{2}, Andrea Romagnoli{2}, Marco Tartagni{1}, Aldo Romani{1}
{1}Alma Mater Studiorum – Università di Bologna, Italy; {2}Taua Società Benefit, Italy

13:30
5845: LSReg-Net: an End-to-End Registration Network for Large-Scale Lidar Point Cloud in Autonomous Driving (INVITED PRE-PUBLISHED JOURNAL PAPER)
Yucheng Tao{3}, Xiuqing Yang{2}, Hanqi Wang{3}, Jian Wang{3}, Zhiyuan Li{3}, Huawei Liang{1}
{1}Chinese Academy of Sciences, China; {2}Civil Aviation Logistics Technology Company Limited, China; {3}University of Science and Technology of China, China

13:45
5848: A Hybrid Approach to Impulse-Radio UWB Self-Localization with Passive Reflectors (INVITED PRE-PUBLISHED JOURNAL PAPER)
Palakon Kotchapansompote{2}, Nakorn Kumchaiseemak{2}, Kamol Kaemarungsi{1}, Supasorn Suwajanakorn{2}
{1}National Electronics and Computer Technology Center (NECTEC), Thailand; {2}Vidyasirimedhi Institute of Science and Technology, Thailand

14:00
5841: Quadratic-Baseline Partitioning of Indoor PM 2.5 Using a Low-Cost Optical Sensor During a Facade Retrofit Case Study
Rostyslav Sipakov, Olena Voloshkina
Kyiv National University of Construction and Architecture, Ukraine

14:15
5864: A Current Chopper-Assisted Magnetic Field-Based Backscatter Communication Method with WPT Overcoming Ultralow Coupling Coefficients (INVITED PRE-PUBLISHED JOURNAL PAPER)
Ryota Fukugasako, Hisafumi Asaue, Tomoki Shiotani, Masanori Hashimoto, Ryo Shirai
Kyoto University, Japan

14:30-16:00
Posters: Emerging Sensor Technologies & Applications 2 (Biomedical)
Session Chair: Luisa Petti
Room: Pre-Function Area

5042: Time-Resolved Diffuse Optics System Based on CMOS Circuits for Perturbation Velocity Measurements in Tissue Mimicking Phantoms
Markku Raappana, Tuomo Talala, Ilkka Nissinen, Jan Nissinen
University of Oulu, Finland

5056: Experimental Mapping of the Human Exposure to Time Varying Magnetic Fields
Céline Vergne{2}, Hugo Nicolas{2}, Manon Lambert{1}, Simone Hemm{2}, Morgan Madec{1}, Joris Pascal{2}
{1}CNRS - University of Strasbourg, France; {2}University of Applied Sciences and Arts Northwestern Switzerland, Switzerland

5189: Development of a Vision-Based System for Analyzing Sleep Behavior of Infants and Young Children in the Home Environment
Satoshi Inagaki{1}, Naoki Sano{1}, Mikiko Oono{2}, Yuki Hashimoto{1}, Tatsuhiro Yamanaka{1}, Yoshifumi Nishida{1}
{1}Institute of Science Tokyo, Japan; {2}National Institute of Advanced Industrial Science and Technology, Japan

5274: Printed Flexible Sensors for Breath Analysis in Non-Invasive Health Monitoring
Ahmad Al Shboul, Ricardo Izquierdo
École de Technologie Supérieure ÉTS, Canada

5408: PVDF Thin-Film Fabrication and Characterization for Surface Acoustic Wave Biosensing
Rishabh Appadurai, Yuu Ono, Ravi Prakash
Carleton University, Canada

5429: Radar-Derived Peak-Trough Interval as a Temporal Marker of Ventricular Repolarization: Good Agreement with the Electrocardiographic J – Tend Interval
Stephanie Pella{2}, Zainab Riaz{2}, Neil Tom{2}, Mark Halaki{3}, Martin Ugander{3}, Tuguy Esgin{1}, Mehmet Yuce{2}
{1}Curtin University, Australia; {2}Monash University, Australia; {3}University of Sydney, Australia

5586: Reflective Multi-PD PPG Sensor for Health Monitoring Under Indoor Ambient Light
Hossein Anabestani, Zeljko Zilic, Sharmistha Bhadra
McGill University, Canada

5626: Textile Sensors for Detecting Swelling Linked to Peripheral IV Failure
Denise Wilson, Lorenzo Guio, Greg Valentine
University of Washington, United States

5700: Edge AI-Enabled Smart Pill for Low-Power, Location-Aware, Closed-Loop Gut Applications
Md Farhad Hassan, Shounak Das, Angsagan Abdigazy, Mohammed Arfan, Yasser Khan
University of Southern California, United States

14:30-16:00
Posters: Imaging & Geolocating Sensor Systems
Session Chairs: Masoud Agah, Aleksandra Markovic
Room: Pre-Function Area

5028: A 32×32 120.4dB Self-Calibrated Analog Counters with Extrapolation for SPAD Imager
Chun-Yi Wu, Ssu-Lei Tu, Chih-Cheng Hsieh
National Tsing Hua University, Taiwan

5093: Fast Wafer Film Thickness Measurement Using Lambda-Capture Camera
Masaki Iizuka{2}, Kenta Tsuji{2}, Kosuke Fujimori{2}, Kota Morishima{2}, Manabu Hashimoto{1}
{1}Chukyo University, Japan; {2}Hamamatsu Photonics K.K., Japan

5169: An Optical Measurement System for Open-Source Tracking of Jaw Motions
Paul-Otto Müller, Sven Suppelt, Mario Kupnik, Oskar von Stryk
Technische Universität Darmstadt, Germany

5286: A Small-Area and Low-Power Readout Circuit for a LOFIC CMOS Image Sensor
Seina Hori, Nao Kitajima, Ai Otani, Hiroaki Ogawa, Shunsuke Okura
Ritsumeikan University, Japan

5290: Autoregressive Artefact Detection in Finger Movement Decoding for Electroencephalography Brain Computer Interfaces
Laura Damm, Dai Jiang, Andreas Demosthenous
University College London, United Kingdom

5312: Acoustic Geolocation of Microsystems in Downhole Environments
Yifan Yang, Scott Smith, Alex Benken, Yogesh Gianchandani
University of Michigan, United States

5418: Enhanced PMUT-Based Imaging Using Continuous Wavelet Transform
Mantalena Sarafianou{1}, Gaia Giubilei{2}, Duan Jian Goh{1}, Yul Koh{1}, Silvia Adorno{3}, Alberto Leotti{3}, Chang Kwan Teo{3}, Hwee Hwee Ong{3}
{1}IME, Agency for Science, Technology and Research, Singapore; {2}Politecnico di Torino, Italy; {3}STMicroelectronics, Italy; {3}STMicroelectronics, Singapore

5576: Combined GNSS/Visual Inter-Robot Tracking Method for Open-Path Gas Tomography
Heiko Lohrke, Harald Kohlhoff, Jessica Erdmann, Nicolas Winkler, Patrick Neumann
Bundesanstalt für Materialforschung und -prüfung, Germany

5611: Laser Rangefinder and Steering Mirror Optimization by Radar and Geometric Modeling
William Ediger, Philip Ferguson
University of Manitoba, Canada

14:30-16:00
Posters: Chemical, Electrochemical & Gas Sensors 4
Session Chairs: Bérengère Lebental, Jeong-O Lee
Room: Pre-Function Area

5008: Tuning Carbon Nanofiber Density for Optimized Sensing of Ethanol
Mostafa Shooshtari{2}, Sten Vollebregt{1}, Saeideh Pahlavan{2}, Teresa Serrano-Gotarredona{2}, Bernabé Linares-Barranco{2}
{1}Delft University of Technology, Netherlands; {2}Instituto de Microelectrónica de Sevilla IMSE-CNM, Spain

5044: High Performance WO3 Nanoneedles Decorated with InSe Nanosheets for Detection of NO2
Jyayasi Sharma, Dalal Fadil, Mubdiul Islam Rizu, Eduard Llobet
Universitat Rovira i Virgili, Spain

5168: A Multiplexed Electrochemical Biosensor for Real-Time Glucose and Lactate Monitoring
Md Ridwan Adib{2}, Emer Kennedy{1}, Alan O'Riordan{2}
{1}Teagasc, Animal & Grassland Research and Innovation Centre, Ireland; {2}Tyndall National Institute, Ireland

5213: Next-Generation VOC Sensing: AI-Assisted Gas Prediction Using Hybrid CNT Films Based Flexible Chemiresistive VOC Sensor
Rohan Rohilla, Kinshuk Dasgupta, Jyoti Prakash
Bhabha Atomic Research Centre, Homi Bhabha National Institute, India

5226: Geometry-Inspired Pool-Based Sampling for Gas Sensors Joint Calibration
Qifan Tong, Wenzheng He, Wenshuai Lu, Chengsong Xiong, Zheng You
Tsinghua University, China

14:30-16:00
Posters: Data Processing & AI for Industrial Applications 2
Session Chair: André Lazzaretti
Room: Pre-Function Area

5082: Data Reduction for Energy-Constrained Sensors via Event-Aware Sampling
Nursultan Daupayev, Paul Reber, Ricky Bendyk, Christian Engel, Soeren Hirsch
Brandenburg University of Applied Sciences, Germany

5200: Selectivity Improvement of Impedimetric Ion Sensors Using Convolutional Neural Networks
Matthias Ochs, Eva-Maria Korek, Maximilian Schulz, Ralf Brederlow
Technische Universität München, Germany

5301: Type Identification of Packaged Fruit Juices Using KNN on LDA-Reduced Hydrogel Data
Ragini Vinay Mehta, Shikha Kaiwart, Dibakar Roy, Khushi Dutta, Suchetan Pal, Avishek Adhikary
Indian Institute of Technology Bhilai, India

5455: Machine Learning-Based Band Selection for the Design of a Low-Cost VIS-NIR Microspectrometer for Smart Leaf Nutrient Monitoring
Eleni-Ioanna Koutsovili{1}, Giovanni Lombardo{2}, Salvatore Surdo{3}, Lucanos Strambini{1}, Francesco Longo{2}, Salvatore Serrano{2}, Giuseppe Barillaro{3}, Stefania Matteoli{1}
{1}Consiglio Nazionale delle Ricerche, Italy; {2}Università degli Studi di Messina, Italy; {3}Università di Pisa, Italy

5484: Early H2 Sensor Response Prediction Using a Multi-Layer Perceptron (MLP)
Raduan Sarif{2}, Carlo Tiebe{2}, Christian Herglotz{1}
{1}Brandenburg University of Technology Cottbus–Senftenberg, Germany; {2}Bundesanstalt für Materialforschung und -prüfung, Germany

5530: Investigating Performance Enhancements of CMUT Based Flow Measurement Using Regression Techniques
Meghana Vishwanatha{2}, Ivan Kraljevski{1}, Ilkin Alkhasli{1}, Nooshin Saeidi{2}, Karman Selvam{2}, Maik Wiemer{2}, Harald Kuhn{2}
{1}Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany; {2}Fraunhofer Institute for Electronic Nano Systems ENAS, Germany

5623: Plastic Material Identification for Recycling Using 1D SWIR Spectral Data with AutoEncoder-Assisted XGBoost Classification
Kihyun Hwang{3}, Chang-Sug Lee{2}, Sang Jun Lee{1}, Hyeon-June Kim{3}
{1}Korea Research Institute of Standards and Science, Korea; {2}Korea Spectral Products Co., Ltd., Seoul, Republic of Korea, Korea; {3}Seoul National University of Science and Technology, Korea

5625: An Unsupervised Learning Algorithm for Impulse-Based Detection and Categorization of Bedload Transport Using Hydro-Acoustic Data
Quinn Morgan{1}, Nate Sjullie{1}, Mitch Montee{1}, James White{2}, David Burnett{1}
{1}Portland State University, United States; {2}United State Geological Survey, United States

5677: Quantifying and Predicting Noise Impacts of Small Aircraft: A Scalable Framework for Measurement and Analysis
Vinamra Singhal
Independent Researcher, United States

5678: Wheel Force-Based Road Surface Classification for Intelligent Tire Testing
Ti Wu{3}, Dong Wang{3}, Lihang Feng{2}, Weigong Zhang{3}, Xiaolong Zhang{1}, Huawen Yan{3}
{1}Anhui Agricultural University, China; {2}Nanjing Tech University, China; {3}Southeast University, China

5719: Battery Core Temperature Sensing Using Electrochemical Impedance Spectroscopy and Data-Driven Regression: A Comparative Evaluation
Shabnam Razmjooei{1}, Saleh Mohammed Shahriar{1}, Amir Shabani{1}, Assa Aravindh Sasikala Devi{2}, Tina Shoa{1}
{1}Simon Fraser University, Canada; {2}University of Oulu, Finland

5722: State of Charge Estimation of Batteries Using Physics Guided Neural Network and Sensor Data
Saleh Mohammed Shahriar, Shabnam Razmjooei, Amir Shabani, Tina Shoa
Simon Fraser University, Canada

5664: Sub-50 µs Sample-Level Synchronization in a Battery-Powered BLE MEMS Accelerometer Node for Industrial Vibration Monitoring
Reza Taherkhani, Swarna Narayanan, Stoyan Nihtianov
Delft University of Technology, Netherlands

14:30-16:00
Posters: Microfluidics & Biosensors 1
Session Chair: Yoshikazu Hirai
Room: Pre-Function Area

5069: Proposal for a Resin Type Sap Flow Velocity Sensor and its Demonstration Experiment in a Greenhouse
Yusuke Sakamoto, Yuichi Maruo, Fusao Shimokawa
Kagawa University, Japan

5172: Fluorometric Detection of Cobalt Ions Using an Ion Imprinted Polymer Thin Film-Based Microfluidic Sensor
Ali Doostmohammadi, Siu Ning Leung, Pouya Rezai
York University, Canada

5241: Point-of-Care Sensors for Salivary Endotoxin Detection
Andrew Steckl, Daewoo Han, Adewale Ahinmoye, Pietro Strobbia
University of Cincinnati, United States

5284: CMOS Impedance Sensor with 128×128 Microelectrode Arrays for Measuring Surface Coverage of Microparticles
Hyunseo Shin{1}, Dakyung Kang{2}, Jungkyu Kim{2}, Nam-Seog Kim{1}
{1}Chungbuk National University, Korea; {2}University of Utah, United States

5389: Origami-Inspired 3D Sensor Platform for Real-Time Electromechanical Coupling Analysis in Engineered Heart Tissues
Longlong Li, Fatima Tufail, Haolan Sun, Jongyun Kim, Hee-Gyeong Yi, Dong-Weon Lee
Chonnam National University, Korea

5407: Electrochemical Impedance Driven Detection of Viral RNA from Human Plasma: Comparative Insights from PCR and RT-LAMP
Ranamay Saha{1}, Sagnik Sarma Choudhury{1}, Ekta Gupta{2}, Shantanu Bhattacharya{1}
{1}Indian Institute of Technology Kanpur, India; {2}Institute of Liver and Biliary Sciences, India

5528: Multivariate and Multiharmonic Impedimetric Analysis for Sensitivity Improvement of miRNA-21 Detection
Francesca Izzo{2}, Annesha Mazumder{2}, Florence Poulletier de Gannes{2}, Hamida Hallil{1}
{1}CNRS, IMS, UMR 5218, Bordeaux INP, University of Bordeaux, France; {2}Université de Bordeaux, France

5607: A Tube-Integrated Sensing System for Continuous Cell Culture Monitoring
Zheyuan Zhang{2}, Shirin Parvin{2}, Mick Wu{1}, Meng Lu{2}
{1}Ames High School, United States; {2}Iowa State University, United States

5724: CLAW: Hybrid Microfluidic-Mechatronic Precipitator for LAMP-Based Airborne Pathogen Sensors
Jahsim Albaghdadi, Arian Ghaicy, John Sabino, Michael Caffrey
University of Illinois Chicago, United States

14:30-16:00
Posters: Acoustic & Ultrasound Sensors 2
Session Chair: Edmond Cretu
Room: Pre-Function Area

5142: Enhanced VZO-Based PMUT for Advanced Acoustic Sensing
Jianing Zhang{2}, Xinyu Chen{2}, Chenhao Luo{2}, Jian Luo{2}, Guicai Fang{1}, Xingxu Zhang{2}, Binghe Ma{2}
{1}China Aerodynamics Research and Development Center, China; {2}Northwestern Polytechnical University, China

5192: Electromechanical Characterization of Dual-Electrode Circular PMUTs with Comparative Analysis of Top Electrode Layouts
Yumna Birjis, Pavithra Munirathinam, Haleh Nazemi, Arezoo Emadi
University of Windsor, Canada

5218: Large-Area Surface Acoustic Wave Cleaning for Enhanced Optical Performance of LiDAR Sensors
John Claud Jonas{2}, Heesoo Kim{2}, Saeah Kim{1}, Hyung Ham Kim{2}
{1}Hyundai Motor Group, Korea; {2}Pohang University of Science and Technology, Korea

5232: Microacoustic Ice Detection and Thickness Measurement for Wireless Condition Monitoring
Philipp Schulmeyer{2}, Manfred Weihnacht{1}, Hagen Schmidt{2}
{1}InnoXacs, Germany; {2}Leibniz-Institute for Solid State and Materials Research Dresden, Germany

5308: Doughnut-Shaped On-Chip WGM Microshell Resonator for Air-Coupled Ultrasound Sensing
Chichen Huang, Shengli Zhang, Jiayuan Zhang, Srinivas Tadigadapa
Northeastern University, United States

5334: An Aerosol Jet Printed High-Piezoelectric Sensor for Acquisition of Dynamic Disturbance
Yiyin Su{2}, Qingqing Wang{1}, Xiaohui Yang{2}, Zhichao Zheng{2}, Yongdu Ruan{2}, Zhongqing Su{1}, Junhui Shi{2}
{1}Hong Kong Polytechnic University, Hong Kong; {2}Zhejiang Lab., China

5335: Bias Optimization and Polymer Encapsulation Synergy for Immersion PMUTs: A Comparative Study of Sylgard 160 and 184
David Sze Wai Choong{1}, Sagnik Ghosh{1}, Yu Feng Thien{1}, Mantalena Sarafianou{1}, Duan Jian Goh{1}, Srinivas Merugu{1}, Alberto Leotti{2}, Ravi Shankar{2}, Dao Hao{2}, Silvia Adorno{2}, Alessandro Stuart Savoia{3}, Yul Koh{1}
{1}IME, Agency for Science, Technology and Research, Singapore; {2}STMicroelectronics, Italy; {2}STMicroelectronics, Singapore; {3}Università degli Studi Roma Tre, Italy

5468: Improving the Accuracy of Direction-of-Arrival Estimation for Underwater Acoustic Signals Using a Semi-Circular Array and Wall Reflections
Taiga Saito, Tadashi Ebihara, Atsushi Tsuchiya, Yuji Sato, Naoto Wakatsuki, Keiichi Zempo
University of Tsukuba, Japan

5889: Improving Distributed Acoustic Sensing Optical Phase Measurement by Local Oscillator Closed Loop Frequency Tuning
Beatriz Brusamarello{2}, Danilo Fernandes Gomes{2}, Guilherme Heim Weber{2}, Daniel Rodrigues Pipa{2}, Cicero Martelli{2}, Manoel Feliciano Da Silva Junior{1}, Sérgio Taveira de Camargo Júnior{1}, Jean Carlos Cardozo Da Silva{2}
{1}Petrobras, Brazil; {2}Universidade Tecnológica Federal do Paraná, Brazil

14:30-16:00
Posters: Sensor Systems and Processing
Session Chair: Robert Roberts
Room: Pre-Function Area

5825: Design Space Exploration of an In-Sensor Processor for Object Classification in Ultracompact Time-of-Flight Sensors (INVITED PRE-PUBLISHED JOURNAL PAPER)
Andrea Fasolino{2}, Rosalba Liguori{2}, Luigi Di Benedetto{2}, Alfredo Rubino{2}, Danilo Pau{1}, Gian Domenico Licciardo{2}
{1}STMicroelectronics, Italy; {2}Universita di Salerno, Italy

5826: Analog Demodulation for Electrically Modulated Me Sensors: a Signal Integrity Analysis and Evaluation Approach (INVITED PRE-PUBLISHED JOURNAL PAPER)
Johan Arbustini{1}, Eric Elzenheimer{1}, Henrik Wolframm{1}, Elizaveta Spetzler{1}, Michael Kuhn{3}, Felix Schlichting{1}, Eckhard Quandt{1}, Jeffrey McCord{1}, Michael Höft{1}, Robert Rieger{1}, Andreas Bahr{2}
{1}Christian-Albrechts-Universität zu Kiel, Germany; {2}Dresden University of Technology, Germany; {3}Hochschule Darmstadt University of Applied Sciences, Germany

5827: Angle-Agnostic Radio Frequency Sensing Integrated Into 5G-NR (INVITED PRE-PUBLISHED JOURNAL PAPER)
Dariush Salami{1}, Ramin Hasibi{3}, Stefano Savazzi{2}, Tom Michoel{3}, Stephan Sigg{1}
{1}Aalto University, Finland; {2}National Research Council of Italy, Italy; {3}University of Bergen, Norway

5828: Assessing Noise Effects on UAV Classification Accuracy with Deep Learning and FPGA Real-Time Processing: a Study Utilizing Radar Digital Twins (INVITED PRE-PUBLISHED JOURNAL PAPER)
Taher Ahmed{1}, Ahmed Sayed{3}, Ahmed Youssef{1}, George Shaker{3}, Magdy Elbahnasawy{2}
{1}Military Technical College, Egypt; {2}Technical Research Center, Egypt; {3}University of Waterloo, Canada

5829: Key Metrics and Experimental Test Bench for Assessing Highly Sensitive Magnetometers in Research (INVITED PRE-PUBLISHED JOURNAL PAPER)
Eric Elzenheimer{1}, Silvia Knappe-Grüneberg{4}, Jan Zerfowski{2}, William Evans{4}, Fabian Grüneberg{4}, Michael Höft{1}, Surjo R. Soekadar{2}, Stephen Robinson{3}, Jens Voigt{4}
{1}Christian-Albrechts-Universität zu Kiel, Germany; {2}Clinical Neurotechnology Lab, Charité – Universitätsmedizin Berlin, Germany; {3}MEG Core Facility, NIMH, National Institute of Mental Health, United States; {4}Physikalisch-Technische Bundesanstalt, Germany

5830: Analysis of Beam Pattern Variation Due to Frequency Noise in Frequency Diverse Array Using Cramér-Rao Bound and FDTD (INVITED PRE-PUBLISHED JOURNAL PAPER)
Yunsoo Kim, Youngwook Kim
Sogang University, Korea

5832: A Robust and Runtime-Efficient Track-to-Track Fusion for Automotive Perception Systems (INVITED PRE-PUBLISHED JOURNAL PAPER)
L. Lindenmaier, B. Czibere, S. Aradi, T. Bécsi
László Lindenmaier, Balázs Czibere, Szilárd Aradi, Tamás Bécsi

5835: A More Reliable Equivalent Circuit of Electrochemical Sensors for Robust Design of CMOS Front-Ends (INVITED PRE-PUBLISHED JOURNAL PAPER)
Ali Meimandi{2}, Gian Luca Barbruni{2}, Sandro Carrara{1}
{1}Bio/CMOS Interfaces Laboratory, École Polytechnique Fédérale de Lausanne, Switzerland; {2}École Polytechnique Fédérale de Lausanne, Switzerland

5090: New Method for Evaluating the Deformability of Foods to Determine Their Choking Risk to Infants and Young Children
Haruka Tokutomi{1}, Kan Takagi{1}, Mikiko Oono{2}, Koji Kitamura{2}, Tatsuhiro Yamanaka{3}, Yuki Hashimoto{1}, Yoshifumi Nishida{1}
{1}Institute of Science Tokyo, Japan; {2}National Institute of Advanced Industrial Science and Technology, Japan; {3}Safe Kids Japan, Japan

5918: Point Cloud-Based 3D Tracking for Asynchronous and Uncalibrated Multi-Camera Systems
Junhao Li, Kohei Shimasaki, Feiyue Wang, Idaku Ishii
Hiroshima University, Japan

5917: Comparative Evaluation of Non-fiducial Techniques Toward User Authentication by Non-contact Electromagnetic Sensor on Chest Wall
Shun Hinatsu, Hidetoshi Makimura
Mitsubishi Electric Corporation, Japan

5929: A Multimodal Decision-Fusion Network Approach for Activity Recognition in Firefighter Self-Contained Breathing Apparatus Endurance Training
Xiaoqing Chai{1}, Junhang Yu{3}, Boon Giin Lee{3}, Matthew Pike{3}, Lionel Nkenyereye{2}, Wan-Young Chung{2}
{1}NingboTech University, China; {2}Pukyong National University, Korea; {3}University of Nottingham Ningbo China, China

5930: Transfer Learning of Human Activities Based on IMU Sensors: A Review Sara (INVITED PRE-PUBLISHED JOURNAL PAPER)
Sara Ashry{1}, Supratim Das{2}, Mahdie Rafiei{2}, Jan Baumbach{2}, Linda Baumbach{2}
{1}Electronic Research Institute, Egypt; {2}Hamburg University, Germany

16:00-17:00
Wearable Sensors 1
Session Chair: Noriko Tsuruoka
Room: Kitsilano A

16:00
5770: Advancing On-Demand Sweat Biosensing via a Flexible Iontophoretic Platform (INVITED)
Moritz Ploner{2}, Benjamin Schmid Ties{1}, Arvind Gurusekaran{1}, Giulia Elli{1}, Luisa Petti{2}
{1}Free University of Bozen-Bolzano, Italy; {2}Sensing Technology Laboratory, Libera Università di Bolzano, Italy

16:30
5167: Nature-Inspired Tough and Freezing-Resistant Organohydrogel via 3D Printing for Flexible Sensors
Hanqiang Zhang{2}, Peiren Wang{1}, Ji Li{2}
{1}Imperial College London, United Kingdom; {2}Southeast University, China

16:00-17:00
Sensors for Animal Monitoring
Session Chairs: Ryutaro Maeda, Toshihiro Itoh
Room: Kitsilano B

16:00
5751: Development of Simple and Highly Sensitive Antigen Test Kits for On-Site Testing of Infectious Diseases at Livestock Production Sites (INVITED)
Masaya Miyazaki
HaKaL inc., Japan

16:30
5295: A Collar Device for Monitoring Cattle Mastication and Eructation Sounds
Shun Muramatsu{2}, Natsuhiko Mascia{2}, Jarred Fastier-Wooller{2}, Michitaka Yamamoto{2}, Satoshi Koike{1}, Toshihiro Itoh{2}
{1}Hokkaido University, Japan; {2}University of Tokyo, Japan

16:45
5298: In Vivo Volatile Fatty Acid Measurement in the Rumen of Cattle Using Polybutadiene-Coated Quartz Crystal Microbalance Sensor
Jarred Fastier-Wooller{3}, Shun Muramatsu{3}, Michitaka Yamamoto{3}, Shintaro Noda{1}, Naoki Shiraishi{1}, Hironao Okada{2}, Yoshihiro Muneta{1}, Shozo Arai{1}, Toshihiro Itoh{3}
{1}National Agriculture and Food Research Organization, Japan; {2}National Institute of Advanced Industrial Science and Technology, Japan; {3}University of Tokyo, Japan

16:00-17:00
Optical Sensors & Resonators
Session Chair: Monika Janik
Room: Kitsilano C

16:00
5735: Nanograting Microring Optical Resonators for Enhanced Refractive Index Sensitivity
Anh Igarashi{1}, Yasuo Ohtera{2}, Tatsuo Yoshinobu{1}, Hirohito Yamada{1}
{1}Tohoku University, Japan; {2}Toyama Prefectural University, Japan

16:15
5842: Ambiguity-Free, Multiparametric, and Multipoint Fiber Refractometer Based on the Hilbert Transform (INVITED PRE-PUBLISHED JOURNAL PAPER)
Jonathan Esquivel-Hernandez{1}, Rodolfo Martinez-Manuel{1}, Daniel Maldonado-Hurtado{2}, Luis Valentin-Coronado{1}, David Barrera{2}, Hector Garcia-Miquel{2}, Salvador Sales{2}
{1}Centro de Investigaciones en Optica, A.C., Mexico; {2}Universitat Politècnica de València, Spain

16:30
5847: Force Estimation of Five Fingers Using Infrared Optical Sensors and an IMU and its Application to Analysis of Sports Motion (INVITED PRE-PUBLISHED JOURNAL PAPER)
Shota Miyake, Tamon Miyake
H2L inc., Japan

16:00-17:00
Data Processing & AI for Chemical Sensing
Session Chair: Ashish Pandharipande
Room: Kitsilano D

16:00
5222: Uncertainty Quantification via Bayesian Inference on CNNs for MOS Gas Sensors in Temperature Cycled Operation
Sebastian Pültz, Dennis Arendes, Christian Bur, Andreas Schütze
Universität des Saarlandes, Germany

16:15
5260: Feed Forward Neural Network Based Automated Gas Source Localization Using UAV: A Case Study on CO2 Source Tracking
Harshit Kumar Sahu, Pritika Marik, Chiranjib Ghosh, Soumajit Pramanik, Kaushik Bandyopadhyay, Avishek Adhikary
Indian Institute of Technology Bhilai, India

16:30
5659: Reconstruction of Full Time Series Data from Gas Sensor Array by Partial Measurement Using Sparse Sensor Placement Optimization Method
Shigeyasu Uno
Ritsumeikan University, Japan

16:45
5327: Mean-Reverting Stochastic Modeling of Instrumental Drift in NDIR CO2 Sensors
Cheng Yang, Tobias J. Oechtering
KTH Royal Institute of Technology, Sweden

16:00-17:00
Sensor Materials, Fabrication & Packaging 1
Session Chairs: Sharmistha Bhadra, Dong-Weon Lee
Room: Fairview I & II

16:00
5749: Active Sidewall Passivation Layers for High-Performance Diodes (INVITED)
William Wong
University of Waterloo, Canada

16:30
5198: Robust ITO-Al2O3 Composite Thin Film Sensors for Extreme High-Temperature Applications via Microstructural Stabilization
Tao Zhang, Shengming Ma, Yilin Fan, Yunzhe Liu, Yuanying Zhang, Tao Ye, Xingxu Zhang, Binghe Ma
Northwestern Polytechnical University, China

16:45
5381: Aging Effect on APCVD-Grown 2D MoS2 Monolayer in NO2 Gas Sensing
Chandrabhan Patel, Sumit Chaudhary, Vikash Kumar Verma, Mayank Dubey, Brahmadutta Mahapatra, Shaibal Mukherjee
Indian Institute of technology Indore, India

16:00-17:00
Optical Sensors 2
Session Chairs: Serhiy Korposh, Johannes Klueppel
Room: Fairview III & IV

16:00
5063: Raman Sensor Based on a Single-Pixel Detector for Monitoring H2 in Natural Gas Blends
Jacob Gottfried{2}, Yan Zhao{1}, Scott Sanders{2}
{1}GTI Energy, United States; {2}University of Wisconsin-Madison, United States

16:15
5490: Quasi p-i-n Organic Photodetectors for Self-Powered Dual-Wavelength Sensing
Hossein Anabestani, Zeljko Zilic, Sharmistha Bhadra
McGill University, Canada

16:30
5447: Fully-Integrated Miniature LiDAR with 2.3k Points Resolution
Fabrice Martin, Xavier Branca, Mathieu Auvray, Pascal Mellot, Neale Dutton, Andreas Assmann, Brandon Johnson, Fraser Williams, Axel Crocherie, Sara Pellegrini, Yandong Mao
STMicroelectronics, China; STMicroelectronics, France; STMicroelectronics, United Kingdom

16:45
5440: Noise and Interference Co-Suppression Technique in SPAD-Based Direct Time-of-Flight (d-ToF) Pulsed LiDAR Sensors
Sadra Tafaghodi Jami{1}, Sobhan Dabidian{2}, Zahra Kavehvash{2}, Ali Fotowat-Ahmady{2}, Jie Yuan{1}
{1}Hong Kong University of Science and Technology, Hong Kong; {2}Sharif University of Technology, Iran

16:00-17:00
Data Processing
Session Chair: Danilo Pau
Room: Fairview V

16:00
5760: A Novel Diamond-Based Radiation Monitoring System for Real-Time Diagnostics of Pulsed Electron Beams
Stefano Salvatori{3}, Sara Pettinato{3}, Giulia Sinisi{4}, Lorenzo Galluzzo{2}, Giuseppe Felici{2}, Marco Girolami{1}, Maria Cristina Rossi{4}
{1}CNR - Consiglio Nazionale delle Ricerche, Italy; {2}SIT – Sordina IORT Technologies S.p.A., Italy; {3}Università degli Studi Niccolò Cusano, Italy; {4}Università degli Studi Roma Tre, Italy

16:15
5817: In-Vehicle Sensor System for Monitoring Efficiency of Vehicle E/E Architectures
Henning Peitzmeier{2}, Julin Horstkötter{1}, Claas Tebruegge{1}, Felix Kortmann{3}, Arthur Seibel{4}, Ghada Bouattour{4}
{1}HELLA GmbH & Co KGaA, Germany; {2}HELLA GmbH & Co. KGaA & Leuphana University Lüneburg, Germany; {3}HELLA Ignite GmbH, Germany; {4}Leuphana Universität Lüneburg, Germany

16:30
5802: Wideband Near-Field Microwave Imaging with Optimal Standoff Using a Metasurface-Enhanced Printed Dipole Antenna
Soumya Chakravarty{2}, Anwesha Khasnobish{2}, M. Jaleel Akhtar{1}
{1}Indian Institute of Technology Kanpur, India; {2}TCS Research, Tata Consultancy Services, India

16:45
5849: Speckle Noise Reduction in FMCW Lidar Using Intensity-Weighted Signal Acquisition with a Quadrant Photodiode Receiver
Jubong Lee, Kyungwon Kim, Kyihwan Park
Gwangju institute of science and technology, Korea

16:00-17:00
Bioelectronic Sensors
Session Chair: Yoshikazu Hirai
Room: Granville

16:00
5744: Electrochemical Sensor Integration for Advanced Microphysiological Systems (INVITED)
Kosuke Ino
Tohoku University, Japan

16:30
5313: Novel Detection of Apoptosis-Associated Speck-Like Protein Using Single Domain Antibodies and Organic Electrolyte-Gated Field-Effect Transistors
Dylan Layton-Matthews{1}, Srishti Johri{1}, Jagdeep Sandhu{2}, Ravi Prakash{1}
{1}Carleton University, Canada; {2}National Research Council of Canada, Canada

16:45
5190: Real-Time and Label-Free Electronic Sensing of Bacterial Conjugation Using Graphene Microchips
Vinay Kammarchedu, Derrick Butler, Taejung Chung, Adam Bolotsky, Jasna Kovac, Aida Ebrahimi
Pennsylvania State University, United States

16:00-17:00
Quantum Sensors
Session Chair: Yi Chiu
Room: Cambie

16:00
5824: On-Chip Control of two-Dimensional Materials via MEMS (INVITED)
Yuan Cao
University of California, Berkeley, United States

16:30
5079: Multi Pass Terbium-Doped Gallium Garnet Faraday Rotation Magnetometer with 90 nT/√Hz Sensitivity at Room Temperature
Massood Tabib-Azar
University of Utah, United States

16:45
5365: MEMS Magnetometer Arrays for Frequency Multiplexing Wearable Nuclear Magnetic Resonance
Massood Tabib-Azar
University of Utah, United States

8:00-9:30
Posters: Emerging Sensor Technologies & Applications 3 (Environmental)
Session Chair: Paddy French
Room: Pre-Function Area

5035: Piecewise-Linear Stretchable Sensors for On-Board Motion Capture Using Frenet-Serret Frames
Aiden Shaevitz, Callen Votzke, Joseph Karam, Alessandro Giuliani, Joseph Davidson, Matthew Johnston
Oregon State University, United States

5124: A Low-Cost Open-Source BLE-Based Asian Hornet Tracking System
Gilles Callebaut{1}, Jan Van Moer{2}
{1}Katholieke Universiteit Leuven, Belgium; {2}Van Moer Consultancy, Belgium

5146: A Two-Step Calibration Method of Risley-Prism Solid-State LiDAR for Planar Measurement Environment
Dongha Kwon, Byungjin Lee, Hyeongseob Shin, Juyoung Seo, Sangkyung Sung
Konkuk University, Korea

5179: Embedded Deep Learning for Bio-Hybrid Plant Sensors to Detect Increased Heat and Ozone Levels
Till Aust, Christoph Karl Heck, Eduard Buss, Heiko Hamann
Universität Konstanz, Germany

5360: Printed Differential Microwave Ring Resonator Based Liquid Sensor on Biodegradable Substrate
S M Ishraqul Huq{1}, Gaozhi Xiao{2}, Sharmistha Bhadra{1}
{1}McGill University, Canada; {2}National Research Council (NRC) Canada, Canada

5367: Visual Sensing Platform for Quantitative Analysis of Water Contaminants
Muersha Wusiman, Fariborz Taghipour
University of British Columbia, Canada

5376: Real-Time Stretchable Strain Sensor Using CMOS-Based Time-Domain Reflectometry
Calder Wilson, Flaviu-Cristian Moldovan, Matthew Johnston
Oregon State University, United States

5390: A Comparative Evaluation of Low-Cost Soil-Moisture Sensors for Precision Agriculture
Douglas Renaux{1}, Gabrielly Pereira{3}, André Eugenio Lazzaretti{1}, Gabriel Hrysay{2}, Marco Gonçalves{2}, Fabio Fukuda{2}, Carlos Lima{1}, Alan Santos{4}
{1}Universidade Tecnológica Federal do Paraná, Brazil; {2}UTFPR, Brazil; {3}UTFPR/CPGEI, Brazil; {4}UTFPR/PPGCA, Brazil

5698: Passive Spherical Capacitive-Based Resonant Sensor for Wireless Soil Moisture Monitoring
Sheng Ding{1}, Qiwu Zhang{1}, Shad Roundy{1}, Kam K Leang{1}, Cody Zesiger{2}, Darrin J Young{1}
{1}University of Utah, United States; {2}Utah State University, United States

5491: Photoacoustic Sensing in Sustainable Mining: Predicting Coal Susceptibility to Spontaneous Combustion
Abhijeet Gorey, Pathikrit Gupta, Amit Swain, Subhasri Chatterjee, Chirabrata Bhaumik, Tapas Chakravarty
TCS Research, Tata Consultancy Services, India

8:00-9:30
Posters: Radar, Array, & Acoustic Sensors Systems
Session Chairs: Masoud Agah, Gaia Giubilei
Room: Pre-Function Area

5045: Acoustic Resonance Sensing for Game Controller
Kevin Xu, Anupama Sitaraman, Kuang Yuan, Yuvraj Agarwal, Mayank Goel, Justin Chan
Carnegie Mellon University, United States

5073: An Optimized Fast Calibration Algorithm for Magnetic Sensor Arrays
Yufei Xue, Xiaoyang Wu, Shuang Song
Harbin Institute of Technology, China

5319: Non-Invasive Contactless Heart Rate Monitoring for Application Onboard Ultra-Low Power Smart-Glasses
Paul Joseph, Jonathan Hungerbühler, Tommaso Polonelli, Michele Magno
ETH Zürich, Switzerland

5404: Real-Time Front-End Adaptation for Energy-Efficient mmWave Radar Sensor
Jinhyeok Park{2}, Sudarshan Sharma{2}, Wei-Chun Wang{2}, Alex Saad-Falcon{2}, Russ H. Huang{1}, Alyosha Molnar{1}, Justin Romberg{2}, Saibal Mukhopadhyay{2}
{1}Cornell University, United States; {2}Georgia Institute of Technology, United States

5415: Influence of Snow Surface Contaminants on Automotive Radar Systems
Jeongmin Kang{1}, Tobias Eidevåg{2}, Oskar Hamidi{2}, Karl Vanäs{2}, Emil Nilsson{1}, Ross Friel{1}
{1}Halmstad University, Sweden; {2}Volvo Car Corporation, Sweden

5438: A Low-Cost X-Band FMCW Phased Array ISAC System for Short-Range SAR Imaging and Backscatter Communication
Nicole Pham, Kevin Ho, Matthew S Reynolds
University of Washington, United States

5616: Simultaneous Doppler Velocimetry and Backscatter Communication with a Low-Cost X-Band Radar Module
Kevin Ho, Sara Reyes Lopez, Matthew Reynolds
University of Washington, United States

5642: Towards a Modular Digital Sensor Interface for Resilient Sensor Measurements
Ryan Price{3}, Gabriel Saucedo{3}, Emilio Jackson{3}, Zander Lin Cox{2}, John Perez{1}, Robert Roberts{3}
{1}Pantex Plant, United States; {2}Texas A&M University, United States; {3}University of Texas at El Paso, United States

5679: A Novel Time Synchronization System Design and Application Considering Wave Modulation for Underwater Stereo-PIV Measurement
Jaehoon Lee, Seunghyun Hwang, Young-Yeon Lee
Korea Research Institute of Ships and Ocean Engineering, Korea

8:00-9:30
Posters: Chemical, Electrochemical & Gas Sensors 5
Session Chairs: Santiago Marco Colas, Jeong-O Lee
Room: Pre-Function Area

5257: CMOS Image Sensor as Colorimtric Gas Sensor for Ammonia and Amine Detection
Sonja Hoffmann, Michael Henfling, Sabine Trupp
Fraunhofer Institute for Electronic Microsystems and Solid State Technologies EMFT, Germany

5309: Graphitic Carbon Nitride-Based SAW Sensor for Sensitive Detection of Formaldehyde
Marius Stoian, Cosmin Obreja, Valentin Buiculescu, Adrian Dinescu, Angela Baracu
IMT Bucharest, Romania

5317: Fabrication and Functional Validation of Insertable Sucrose Image Sensor for Monitoring of Plant Photosynthetic Products
Toshihiko Noda, Yusuke Matsushita, Hideo Doi, Kotaro Takayama, Ik-Hyun Kwon, Yong-Joon Choi, Kazuhiro Takahashi, Kazuaki Sawada
Toyohashi University of Technology, Japan

5331: Performance Evaluation and Benchmarking of ALD-Based Ultra-Thin SnO_2 MEMS Sensors
Mahaboobbatcha Aleem{1}, Baha Erim Uzunoglu{1}, Anna Leonard{1}, Amay Bandodkar{1}, Bongmook Lee{2}, Veena Misra{1}
{1}North Carolina State University, United States; {2}State University of New York Polytechnic Institute, United States

5332: Gelatin Electrolyte and PEDOT:PSS Based Solid-State OECT for pH Sensing of Acidic Solutions
Junzhi Liu, Sharmistha Bhadra
McGill University, Canada

5342: Organic Semiconductor-Based Light Addressable Potentiometric Sensor Integrated with Near-IR VCSEL
Aravind Satheesh{1}, Chia-Ming Yang{1}, Bing-Huang Jiang{2}, Chih-Ping Chen{2}
{1}Chang Gung University, Taiwan; {2}Ming-Chi University of Technology, Taiwan

5383: Integrated High Dynamic Range Electrochemical Sensors with Self-Modulation for Levodopa Detection
Ruei-Yong Hu{1}, Cheng-Che Yu{1}, Tsung-Heng Tsai{2}, Li-Chia Tai{2}
{1}Institute of Electrical and Computer Engineering, National Yang Ming Chiao Tung University, Taiwan; {2}National Yang Ming Chiao Tung University, Taiwan

5388: Hetero-Core Fiber Optic SPR Sensor for Silica Scale Formation in Geothermal Water
Airi Suka{3}, Ai Hosoki{1}, Sakurako Satake{3}, Fatemeh Abrishamian{3}, Heejun Yang{3}, Akira Ueda{3}, Hideki Kuramitz{3}, Amane Terai{2}
{1}Akita University, Japan; {2}Japan Organization for Metals and Energy Security, Japan; {3}University of Toyama, Japan

5399: Laser-Induced Graphene-Based Flexible Array Gas Sensors for Multi-Gas Detection
Chaoqi Zhang, Shijie Yu, Fan Wu, Misheng Liang, Xiaomeng Bian, Rui You
Laboratory of Intelligent Microsystems, Beijing Information Science and Technology University, China

5886: Dual-Mode LSPR–SERS Sensor Based on Silver Nanoislands for Gas-Phase VOC Detection
Cong Wang, Hao Guo, Yao Wang, Sassa Fumihiro, Kenshi Hayashi
Kyushu University, Japan

8:00-9:30
Posters: Data Processing & AI for Sensor Applications
Session Chairs: Youngwook Kim, André Lazzaretti
Room: Pre-Function Area

5166: Neural ODE-Based Continuous IMU Debiasing for Robust GNSS/INS Integration
Jianan Lou, Rong Zhang
Tsinghua University, China

5184: Automatic Speech Recognition as IoT Sensors via Wireless Ad Hoc Federated Learning
Ryo Yagi, Hiroshi Esaki, Hideya Ochiai
University of Tokyo, Japan

5246: PolarFitts: A More Intuitive Framework for Assessing Myoelectric Control Performance
Shriram Tallam Puranam Raghu{1}, Heather Williams{2}, Erik Scheme{2}
{1}University of Alberta, Canada; {2}University of New Brunswick, Canada

5293: LungXplain: Chunk-Level Modeling for Precise Detection and Localization of Respiratory Events
Tayeb Pourebrahim, Sayeh Bayat, Mariana Bento, Laura Curiel
University of Calgary, Canada

5305: Solar Altitude Guided Scene Illumination
Samed Doğan, Maximilian Hoh, Nico Leuze, Nicolas Rodriguez Peña, Alfred Schöttl
Hochschule für angewandte Wissenschaften München, Germany

5474: Scalable Synthetic Data Generation for HDLSS SERRS cTnI Detection via Conditional GMMs
Sahil Sharma{2}, Thomas Poudevigne-Durance{2}, Sayantan Tripathy{1}, Ng Ka Wai{1}, Muskaan Singh{2}, Liam McDaid{2}, Gerard L. Cote{1}, Samuel B. Mabbott{1}, Saugat Bhattacharyya{2}
{1}Texas A&M University, United States; {2}Ulster University, United Kingdom

5485: In-Sensor Linearization via Physical Computing: A Novel Approach to Sensor Data Preprocessing
Anahita Oliaee, Mohammad Narimani, Behraad Bahreyni
Simon Fraser University, Canada

5541: Leveraging TS2Vec to Enhance Radar-Based Object Detection Under Adverse Weather Conditions
Ziaaddin Sharifisoraki, Marzieh Amini, Sreeraman Rajan
Carleton University, Canada

5574: Quantile Thresholding and Unsupervised AI for Human Spheroids Detection in Tissue-Mimicking Phantoms
Ilaria Benedetti, Fabrizia Auletta, Ivana Barravecchia, Debora Angeloni, Calogero Maria Oddo
Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna, Italy

5593: A Morphologically-Aware Transformer Network for High-Fidelity V1-V5 ECG Lead Generation
Tanay Chitlur{2}, Nagabhushan Chitlur{2}, Ajay Tripuraneni{1}
{1}Baylor College of Medicine, United States; {2}Mycardia.ai, United States

5620: Trainable Fractional Spectrogram for Phonocardiogram Classification
Ebrahim A Nehary, Sreeraman Rajan
Carleton University, Canada

5690: Enhancing Face Orientation Sensing via Frontal Point Cloud Density Augmentation by Novel Distance-Adaptive Downsampling Method
Ryusei Takahashi, Chinthaka Premachandra
Shibaura Institute of Technology, Japan

5400: LUGA: Lightweight Uncertainty-Guided Sensing Resolution Adaptation for Energy Efficient Radar Processing
Sudarshan Sharma, Jinhyeok Park, Hemant Kumawat, Saibal Mukhopadhyay
Georgia Institute of Technology, United States

5492: Far-Infrared Image Deblurring Based on a Thermal Temporal Transient Model by Using Deep Unfolding
Tenshin Kuroiwa{3}, Kosuke Kurihara{3}, Yoshihiro Maeda{1}, Daisuke Sugimura{2}, Takayuki Hamamoto{3}
{1}Shibaura Institute of Technology, Japan; {2}Tokyo Metropolitan University, Japan; {3}Tokyo University of Science, Japan

5650: Event-Based Vibration Measurement via Dynamic Mode Decomposition
Hyuga Okamoto{2}, Kosuke Kurihara{2}, Yoshihiro Maeda{1}, Takayuki Hamamoto{2}
{1}Shibaura Institute of Technology, Japan; {2}Tokyo University of Science, Japan

5868: Lidar Denoising Methods in Adverse Environments: a Review (INVITED PRE-PUBLISHED JOURNAL PAPER)
Ji-Il Park{3}, Seunghyeon Jo{1}, Hyung-Tae Seo{2}, Jihyuk Park{4}
{1}Autocrypt Co., Ltd., Korea; {2}Kyonggi University, Korea; {3}Ministry of National Defense of the Republic of China, Korea; {4}Yeungnam University, Korea

5858: Visualization and Analysis of Perfusion Cluster Velocity from a Large Area Near-Infrared Image Sensor
Adithya Naresh{4}, Akihiko Fujisawa{3}, Xingle Wang{4}, Chung-Kai Chen{4}, Naoki Takada{2}, Gen Koide{2}, Takashi Nakamura{2}, Yusaku Tagawa{5}, Tomoyuki Yokota{1}, Takao Someya{5}
{1}IEI, University of Tokyo, Japan; {2}Japan Display Inc., Japan; {3}JDI Display America, Inc., United States; {4}R&D, JDI Display America, Inc., United States; {5}University of Tokyo, Japan

5861: Rule-Based Detection of Turns and Curves in Naturalistic Driving Using GPS and Gyroscope Data
Omar Hassanin{2}, Shahab Alizadeh{2}, Brenda Vrkljan{1}, Sayeh Bayat{2}
{1}McMaster University, Canada; {2}University of Calgary, Canada

5909: MULTI-Domain Lightweight ADABOOST for REAL-Time Fall Detection on LOW-Power BLE Sensors
Chris Nunez, Tianmin Kong, Ava Hedayatipour
California State University, Long Beach, United States

5910: Applying Machine Learning to a 1D CMOS-MEMS Anemometer for Angle Detection and Range Extension
Lars Holm, Thomas Hackett, Jurriaan Schmitz, Remco Wiegerink, Joost Lötters, Dennis Alveringh
University of Twente, Netherlands

5911: I:E Ratio Estimation Using a Patch-Type Multimodal Sensor for Pulmonary Function Screening of COPD
Yukino Ota{2}, Yoshiaki Nakata{4}, Masato Tsuji{4}, Tomoki Yoshida{4}, Yasuhide Nomura{4}, Hiroshi Nagaoka{4}, Akira Ishikawa{3}, Akio Yamamoto{3}, Kanji Yamada{1}, Masaki Takahashi{2}
{1}Juntendo University, Japan; {2}Keio University, Japan; {3}Kobe University, Japan; {4}Signtle Inc., Japan

8:00-9:30
Posters: Optical Sensors 3
Session Chair: Michiko Nishiyama
Room: Pre-Function Area

5051: Dual-Sensor Approach for Monitoring Coastal Turbidity and Vertical Underwater Visibility Using In-Situ Turbidity Sensors and Satellite Optical Data
Yongmyung Kim{1}, Tae-Sung Kim{1}, Jae-Jin Park{1}, Kyung-Ae Park{2}, Su-Ran Kim{2}
{1}Korea Research Institute of Ships and Ocean Engineering, Korea; {2}Seoul National University, Korea

5125: Fabrication of 400MHz Wideband Optical-Probe Current Sensor Using Bi:RIG Multilayer Structure
Mitsunori Miyamoto{1}, Satoshi Sue{1}, Toshiya Kubo{1}, Makoto Sonehara{3}, Toshiro Sato{3}, Ryuji Osawa{2}
{1}CITIZEN FINEDEVICE CO., LTD., Japan; {2}Seikoh Giken, Japan; {3}Shinshu University, Japan

5352: Waveguides and Optical Resonators for Hydrogen Sensing
Robin Gremaud{1}, Pedro Castro-Fernández{2}, Deran Maas{2}
{1}ABB Research, ABB Switzerland Ltd, Switzerland; {2}ABB Switzerland Ltd, Switzerland

5436: Highly Predictive Modelling of Interferometric Fiber-Optic Gyroscopes and its Experimental Validation
Ludovico Dindelli, Pedro Bossi Núñez, Teresa Natale, Francesco Dell'Olio
Politecnico di Bari, Italy

5520: Optical Fibre-Based Flexure and Strain Sensor for Implantable Biomedical Applications
Alessia Fragapane{2}, Maxime Verstraeten{2}, Ramzi Ben Hassen{2}, Pascal Doguet{2}, Anne Vanhoestenberghe{1}, Antoine Nonclercq{2}
{1}King's College London, United Kingdom; {2}Université Libre de Bruxelles, Belgium

5638: Whispering Gallery Mode Resonances in 2-Photon Polymerized 3D Printed Methacrylate Based Microspheres
Ever Dominguez Rodriguez{2}, Antonio Barbone{1}, Miguel Palacios Mora{2}, Angel Yglecias{2}, Soheil Farazi{1}, Srinivas Tadigadapa{1}, Robert Roberts{2}
{1}Northeastern University, United States; {2}University of Texas at El Paso, United States

5649: Design of Wide-Area Optical Camera Communication System with Fisheye Lens and Diffusion Filter
Emi Kitano, Tadashi Ebihara, Naoto Wakatsuki, Yuka Maeda
University of Tsukuba, Japan

5277: Cell Culture Monitoring with Microcavity Optical Fiber Sensor and Microscopic Imaging
Tomasz Gabler{3}, Mariusz Zdanowicz{2}, Anna Sobiepanek{3}, Marcin Koba{3}, Monika Janik{3}, Mateusz Śmietana{1}
{1}Institute of Microelectronics and Optoelectronics, Warsaw University of Technology, Poland; {2}National Institute of Telecommunications, Poland; {3}Warsaw University of Technology, Poland

5624: Preliminary Wrist Angle Estimation Using FBG Sensors for Hand-Exoskeleton Monitoring
Juan Andrés García{1}, Juan Maldonado-Mejía{1}, Benicio Ribon{1}, Marcelo Eduardo V. Segatto{1}, Carlos A. Cifuentes{2}, Camilo A. Rodriguez Diaz{1}
{1}Federal University of Espirito Santo, Brazil; {2}University of the West of England, United Kingdom

5914: Integrated Optoelectronic Refractometer Based on ZnO Photodetector with EHD-Printed Electrodes and PDMS Waveguide
Hiyary Villena, Jakes Herrera, Ignacio Raúl Matías Maestro, Jesús María Corres
Universidad Pública de Navarra, Spain

5846: Performance Investigation of 4H-SiC Pin Photodiodes with Dual Emitter Designs for Enhanced UV-C Detection
Michael Schraml{1}, Mathias Rommel{1}, Niklas Papathanasiou{4}, Alexander May{1}, Tobias Erlbacher{3}, Jörg Schulze{2}
{1}Fraunhofer Institute for Integrated Systems and Device Technology IISB, Germany; {2}Friedrich-Alexander University of Erlangen-Nuremberg / Fraunhofer IISB, Germany; {3}Nexperia Germany GmbH, Germany; {4}sglux GmbH, Germany

8:00-9:30
Posters: Electromagnetic Sensing
Session Chairs: Mohammad Zarifi, Olga Korostynska
Room: Pre-Function Area

5106: A Metasurface Perfect Absorber Incorporating Piezoelectric Material for Simultaneous Microwave and Vibration Sensing
Mahsa Zabetiakmal, Gunes Karabulut Kurt, Elham Baladi
Polytechnique Montréal, Canada

5164: Transmit-Receive Circuit Concepts for Magneto-Mechanical Resonators
Fabian Mohn{1}, Florian Thieben{1}, Jonas Faltinath{2}, Tobias Knopp{2}
{1}Technische Universität Hamburg, Germany; {2}Universitätsklinikum Hamburg-Eppendorf, UKE / Technische Universität Hamburg, Germany

5209: Microwaves Meets Enzymes: A Flexible, Screen- Printed Biosensor for Specific Lactate Detection
Firas Fatani, Sakandar Rauf, Apala Banerjee, Atif Shamim
King Abdullah University of Science and Technology, Saudi Arabia

5266: Antenna Tracking System for Robust Communication in Ingestible Electronics
Ziyao Zhou, Chenyang Ren, Boyan Li, Chen Shen, Rong Tan, Hen-Wei Huang
Nanyang Technological University, Singapore

5613: An Echo Enhancement Calculation Methodology for Lens-Based Wireless Sensing
Yujie Hua, Huaqing Fan, Hao Xu, Baiyun Wang, Wenxuan Tang
Southeast University, China

5923: Transmission-Mode Phase-Variation Sensor Based on Weakly Coupled Distributed Resonators and Phase Detector for High Sensitivity Applications
Xavier Canalias{2}, Paris Vélez{1}, Pau Casacuberta{1}, Lijuan Su{2}, Nazmia Kurniawati{2}, Ferran Martín{1}
{1}CIMITEC, Universitat Autònoma de Barcelona, Spain; {2}Universitat Autònoma de Barcelona, Spain

5922: Pilot SQUID Evaluation of a MEMS Cantilever Resonator with Monolithic PowderMEMS® Magnets used as a Miniaturized Oscillatory B-Field Marker
Johan Arbustini{1}, Eric Elzenheimer{1}, Silvia Knappe-Grüneberg{4}, Björn Gojdka{3}, Michael Höft{1}, Robert Rieger{1}, Andreas Bahr{2}
{1}Christian-Albrechts-Universität zu Kiel, Germany; {2}Dresden University of Technology, Germany; {3}Fraunhofer Institute for Silicon Technology ISIT, Germany; {4}Physikalisch-Technische Bundesanstalt, Germany

13:00-14:30
Acoustic & Ultrasound Sensors 1
Session Chair: Arezoo Emadi
Room: Kitsilano A

13:00
5065: Wearable Bionic Acoustic Sensors Reconstructing Human Voice from Laryngeal Vibrations
Chang Ge
Beihang University / Beijing University of Aeronautics and Astronautics, China

13:15
5302: Feedthrough Compensation for Force-Feedback Controlled Piezoelectric MEMS Microphones
Til Friebe{2}, Nikita Ovsiannikov{2}, Maximilian Lenz{2}, Christian Bretthauer{1}, Gabriele Schrag{2}
{1}Infineon Technologies AG, Germany; {2}Technische Universität München, Germany

13:30
5350: A Wireless Self-Calibrating Ultrasound Microphone Array with Sub-Microsecond Synchronization
Dennis Laurijssen, Rens Baeyens, Walter Daems, Jan Steckel
Cosys-Lab, University of Antwerp, Belgium

13:45
5459: First Experimental Demonstration of CMUT-Based Sensing for Early-Stage Bearing Faults
Sourav Mukherjee, Brandon Hill, Hani Tawfik, Mohannad Elsayed
MEMS-Vision, Canada

14:00
5531: Non-Contact Detection of Concentration in Fluid Mixtures Using Capacitive Micromachined Ultrasound Transducer (CMUT)
Karman Selvam, Nooshin Saeidi, Yves Schwarzmann, Meghana Vishwanatha, Venkata Shanmukha Srivatsav Pakki, Maik Wiemer, Harald Kuhn
Fraunhofer Institute for Electronic Nano Systems ENAS, Germany

14:15
5595: SincNet-RNN Hybrid Neural Network for Detecting Industrial Faults Through Ultrasonic Signal Processing
Amirhossein Moshrefi, Frederic Nabki
École de Technologie Supérieure ÉTS, Canada

13:00-14:30
Advances in Sensor Phenomenology, Modeling, & Applications 1
Session Chairs: Arum Han, Charusluk Viphavakit
Room: Kitsilano B

13:00
5764: Multilinear Representation and Processing of High-Dimensional Sensor Data (INVITED)
Sherif Sherif
University of Manitoba, Canada

13:30
5674: Molecular Imprinted Polymer (MIP)-Based Optical Sensor for Sensitive Detection of Methamphetamine
Kornlavit Lerdsudkanung{1}, Nuntaporn Kongsawang{1}, Apinya Tubtimrattana{2}, Jakkapan Boonsritan{2}, Parath Thirati{1}, Charusluk Viphavakit{1}
{1}Chulalongkorn University, Thailand; {2}King Chulalongkorn Memorial Hospital, Thailand

13:45
5279: Temperature Experiments for a 3D-Printed Encapsulated Thermal MEMS Wind Sensor Under Low Pressure
Sicun Duan{2}, Zongyuan Cao{2}, Wenjing Zhu{2}, Zhenxiang Yi{2}, Ming Qin{2}, Qing-An Huang{1}
{1}Key Laboratory of MEMS of the Ministry of Education, Southeast University, China; {2}Southeast University, China

14:00
5238: Crack Evolution During Priming of Uniaxial and Biaxial Loaded Crack Based Strain Sensors
Benjamin Sittkus{2}, Volker Bucher{2}, Gerald Urban{1}, Thomas Stieglitz{1}, Ulrich Mescheder{2}
{1}Albert-Ludwigs-Universität Freiburg, Germany; {2}Hochschule Furtwangen University, Germany

13:00-14:30
Wearable Sensors 3
Session Chair: Nouah AlCheikh
Room: Kitsilano C

13:00
5762: Dual-Ear Postauricular PPG and LDF Sensing Platform for Robust Bilateral Hemodynamic Monitoring
Chang-Lin Hu, Chien-Ju Li, Yi-Jung Wang, Yung-Shun Huang, Ming-Jhe Lin, Guan-Lun Li, Pei-Ling Kang, Guan-Yi Lu
Industrial Technology Research Institute, Taiwan

13:15
5768: Wearable Ring-Based System for Measuring Hemodynamic Parameters
Nico Lindström, Jukka-Pekka Sirkiä, Tuukka Panula, Matti Kaisti
University of Turku, Finland

13:30
5793: Generalising Perceived Fatigue Estimation Across Diverse Upper Limb Tasks Using Minimal Wearable Sensors
Malik Qirtas{2}, Marco Sica{4}, Merve Nur Yasar{3}, Patricia O'Sullivan{4}, Brendan O'Flynn{4}, Salvatore Tedesco{5}, Matteo Menolotto{4}, Andrea Visentin{1}
{1}Insight RI Research Centre for Data Analytics, Ireland; {2}Insight RI Research Centre for Data Analytics, University College Cork, Ireland; {3}Sakarya University of Applied Sciences, Turkey; {4}Tyndall National Institute, Ireland; {5}University College Cork, Ireland

13:45
5815: Multimodal Wearable Based Automated Driver Inattention State Assessment Using Multi Devices and Novel Cross-Modal Attention Framework
Pavan Kaveti, Ankit Singh, Digvijay S Pawar, Nagarajan Ganapathy
Indian Institute of Technology Hyderabad, India

14:00
5860: Skin-Attachable Sensor for Continuous Core Body Temperature Monitoring (INVITED PRE-PUBLISHED JOURNAL PAPER)
Yujiro Tanaka{1}, Daichi Matsunaga{1}, Takuro Tajima{1}, Michiko Seyama{1}, Issei Kato{2}, Kei Nagashima{2}
{1}NTT Inc, Japan; {2}Waseda University, Japan

14:15
5870: A Battery-Less and Low-Cost RFID Sensor for Unassisted Multilevel Detection of Sweat Loss (INVITED PRE-PUBLISHED JOURNAL PAPER)
Sergio López-Soriano{1}, Xavier Vilajosana{2}, Joan Melià-Seguí{2}
{1}Universitat Autònoma de Barcelona, Spain; {2}Universitat Oberta de Catalunya, Spain

13:00-14:30
Data Processing & AI for Perception Applications
Session Chair: André Lazzaretti
Room: Kitsilano D

13:00
5469: Real-Time Gumbel-Softmax Adaptive Thresholding for Robust Object Classification Under High Illumination Conditions
Hyeongung Byeon, Tae-Hoon Eom, Hyeon-June Kim
Seoul National University of Science and Technology, Korea

13:15
5368: RadarPoseNet: Human Pose Estimation from Extremely Sparse FMCW Radar Point Clouds
Evgenia Slivko{2}, Öykü Selin Toprak{1}, Vani Raheja{1}, Kay Bierzynski{1}, Lorenzo Servadei{3}, Robert Wille{3}
{1}Infineon Technologies AG, Germany; {2}Infineon Technologies AG, Technical University of Munich, Germany; {3}Technische Universität München, Germany

13:30
5197: Computationally-Efficient Sparsity-Aware Occupancy Grid Mapping for Automotive Driving
Frank Harraway{1}, Peiyuan Zhai{1}, Geethu Joseph{1}, Ashish Pandharipande{2}
{1}Delft University of Technology, Netherlands; {2}NXP Semiconductors, Netherlands

13:45
5627: Task-Difficulty Aware Meta-Learning for Adaptive Few-Shot Human Activity Recognition Using UWB Sensors
Ji-Sang Park{3}, Tae-Hoon Eom{3}, Seung-Hwan Jung{1}, Woo-Jin Yun{2}, Dong-Jin Ji{3}, Hyeon-June Kim{3}
{1}GRIT Custom-IC corp., Seoul, Republic of Korea, Korea; {2}National Nanofab Center, Daejeon, Korea; {3}Seoul National University of Science and Technology, Korea

14:00
5161: Cooperative Automotive Radar System for Ghost Target Spoofing Detection
Hanqing Wu, Cagan Önen, Ashish Pandharipande
NXP Semiconductors, Netherlands

13:00-14:30
Chemical & Electrochemical Sensing
Session Chair: Cody Corbin
Room: Fairview I & II

13:00
5757: Micro-Electrode Based MoS2-Aptamer Functionalised Electrochemical Sensor for Trace Cadmium(II) Detection in Water
Swati Mohanty{1}, Tarun Narayan{2}, Gajendranath Chowdary{1}, Alan O'Riordan{2}, Shiv Govind Singh{1}
{1}Indian Institute of Technology, India; {2}Tyndall National Institute, Ireland

13:15
5761: Flexible Printed Circuit Board-Based Nonenzymatic Lactate Sensor for In-situ Monitoring in Fluid Dynamic Environments
Mu-Yi Fang{2}, Ting-Wei Huang{2}, Tung-Lin Yang{1}, Yu-Ting Cheng{2}, Hsiao-En Tsai{1}, Yih-Sharng Chen{1}
{1}National Taiwan University Hospital, Taiwan; {2}National Yang Ming Chiao Tung University, Taiwan

13:30
5775: Interferent Free Electrochemical Detection of Nitrate in Water Using Copper–Cobalt Based Sensor
Daisy Das, Han Shao, Alan O'Riordan
Tyndall National Institute, Ireland

13:45
5784: Detection of Weak Muscle Fatigue Using Bioimpedance Spectroscopy Based on Current Concentration
Masaya Ishida{2}, Masashi Taniguchi{1}, Zimin Wang{1}, Tetsuya Hirono{1}, Toru Hamasaki{2}, Takashi Katsuno{2}, Noriaki Ichihashi{1}
{1}Kyoto University, Japan; {2}Toyota Central R&D Labs., Inc., Japan

14:00
5805: Scalable and Customizable Tri-Material Microneedle Electrochemical Biosensor Platform with Cleanroom Free Fabrication
Kazim Haider{2}, Trevor Tilly{1}, Victoria Coyle{1}, Colin Dalton{2}
{1}Air Force Research Laboratory, United States; {2}University of Calgary, Canada

14:15
5843: Hybrid SPR-LSPR Uric Acid Sensor: an Innovative Framework for Ultrasensitive, Selective, and Stable Biomolecular Detection
Olabisi Abdullahi Onifade{2}, Mundzir Abdullah{2}, Muhammad Hafiz Abu Bakar{1}, Mohd Adzir Mahdi{1}, Ahmad Shukri Muhammad Noor{1}
{1}Universiti Putra Malaysia, Malaysia; {2}Universiti Sains Malaysia, Malaysia

13:00-14:30
Gas Sensing
Session Chair: Fairview V
Room: Fairview V

13:00
5729: ZnO-Based Chemiresistive Ion Sensors for Identifying Alkali Metal and Alkaline Earth Metal Ions in Solutions
Yoshinari Kimura, Hironori Tohmyoh
Tohoku University, Japan

13:15
5739: Capacitive and Wireless Gas Holdup Sensing in a Loop Reactor Using a Magnetically Coupled Resonant Circuit
Lukas Lauritsch, Florian Linhart, Marco J. Da Silva
Johannes Kepler University Linz, Austria

13:30
5783: Highly Improved Ethanol Gas Sensor sensitivity, Selectivity and Stability of Hierarchically Cube Featured In2O3 Structures Induced by Mn and Co-Doping
Mosima Kgomo-Masoga{2}, Simon Dhlamini{2}, Gugu Mhlongo{1}
{1}CSIR-Central Scientific Instruments Organization, South Africa; {2}University of South Africa, South Africa

13:45
5790: Tunable BTEX Gas Detection at Room Temperature via Composition Engineered MoSe2-WSe2 Nanocomposites
Priyakshi Kalita, Abhik Chanda, Orison Waikhom, Biplob Mondal
Tezpur University, India

14:00
5808: Methane Release Rate Estimation Using Model-Based Gas Tomography
Marius Schaab{3}, Thomas Wiedemann{2}, Patrick Hinsen{1}, Achim J. Lilienthal{3}
{1}DLR German Aerospace Center, Germany; {2}DLR German Aerospace Center / Technical University of Munich, Germany; {3}Technische Universität München, Germany

13:00-14:30
Physical Sensors 2
Session Chair: Yi Chiu
Room: Granville

13:00
5248: Design Optimization of the Quadrature Error in a MEMS Gyroscope
Marian Hörsting, Matthias Wenzel
Robert Bosch GmbH, Germany

13:15
5098: Optical Cantilever Utilizing On-Chip Pattern Laser and Sampling Moiré Method
Soya Sato, Toshihiro Shiratori, Hidetoshi Takahashi
Keio University, Japan

13:30
5251: In Situ Temperature Compensation for Thin-Film Force Sensors
Marcel Plogmeyer{3}, Apirak Tienkaew{2}, Anna Schott{1}, Volker Schulze{2}, Günter Bräuer{3}
{1}Fraunhofer Institute for Surface Engineering and Thin Films IST, Germany; {2}Karlsruhe Institute of Technology, Germany; {3}Technische Universität Braunschweig, Germany

13:45
5385: Differential Resonant Accelerometer with 6 µg/√Hz Noise Floor Based on AlN TPoS Technology
Hsiang-Chun Hsiao, Yu-Chi Chuang, Chih-Peng Liu, Hao-Chiao Hong, Yi Chiu
National Yang Ming Chiao Tung University, Taiwan

14:00
5566: Flexible Barometric Tactile Sensors for Robotic Grasping Applications
Aiden Shaevitz, Srivatsan Balaji, Matthew Johnston, Joseph Davidson
Oregon State University, United States

14:15
5682: Arrayed Triaxial Force Plate System Using High-Speed Line-Scan Camera and Sampling Moiré Method
Yukitake Nakahara, Toshihiro Shiratori, Hidetoshi Takahashi
Keio University, Japan

13:00-14:30
Sensing Systems 3
Session Chair: Yasser Khan
Room: Cambie

13:00
5869: LUGOT: Lidar and UWB Fusion for Global Given Object Tracking Under Mobile Anchors (INVITED PRE-PUBLISHED JOURNAL PAPER)
Yuanyuan Li
Beijing Institute of Technology, China

13:15
5871: Remote Identification of Liquids Using Absorbent Materials: a Passive UHF RFID-Based Method (INVITED PRE-PUBLISHED JOURNAL PAPER)
Sergio López-Soriano, Pol Brunet, Mohammed Ahmed Alsultan, Joan Melià-Seguí
Universitat Oberta de Catalunya, Spain

13:30
5874: Comparative Analysis of Cameras and Software Tools for Skeleton Tracking (INVITED PRE-PUBLISHED JOURNAL PAPER)
Naama Aharony, Amir Meshurer, Maya Krakovski, Yisrael Parmet, Itshak Melzer, Yael Edan
Ben-Gurion University of the Negev, Israel

13:45
5811: Out-of-Plane Printed Photodetectors on Fully Encapsulated Ultra-Thin Chip
Abhishek Singh Dahiya{1}, Sihang Ma{2}, Adamos Christou{1}, Ravinder Dahiya{1}
{1}Northeastern University, United States; {2}Semefab Limited, United Kingdom

14:00
5850: 32-Channel 80 dB Dynamic Range Direct-Injection Current-Integrating ROIC for Ge-on-Si Detectors in a Near-Infrared Micro-Spectrometer
Steffen Epple{1}, Zili Yu{1}, Lena Schad{1}, Mathias Kaschel{1}, Michael Oehme{2}, Jens Anders{3}
{1}IMS CHIPS, Institut für Mikroelektronik Stuttgart, Germany; {2}Institute of Semiconductor Engineering, Universität Stuttgart, Germany; {3}Institute of Smart Sensors, Universität Stuttgart, Germany

14:15
5896: Enhancing Wake-Up Receiver Sensitivity Beyond –68 dBm Without Additional Power Consumption
Robert Fromm{3}, Robert Thiel{2}, Olfa Kanoun{1}, Faouzi Derbel{3}
{1}Chemnitz University of Technology, Germany; {2}Hochschule für Technik, Wirtschaft und Kultur / Leipzig University of Applied Sciences, Germany; {3}Leipzig University of Applied Sciences, Germany

14:30-16:00
Posters: Emerging Sensor Technologies & Applications 4
Session Chairs: Gael Pillonnet, Darrin Young
Room: Pre-Function Area

5177: Personalized POI Prediction from GPS Data Using Graph-Enhanced Transformers: Toward an Intelligent Navigation System
Mackenzie Wallich{1}, Ganesh Babulal{2}, Sayeh Bayat{1}
{1}University of Calgary, Canada; {2}Washington University School of Medicine, United States

5272: Ultra-Sensitive Wireless Capacitive Sensing via Mode Localization in Nonlinear PT-Symmetry
Dongyan Chen, Lei Dong, Qing-An Huang
Key Laboratory of MEMS of the Ministry of Education, Southeast University, China

5353: A Scalable Ultra-Low Power Temperature Gradient Sensor Using Pulse Coupled Oscillators
Kyubum Shim, Paragkumar Chaudhari, Alyssa Apsel
Cornell University, United States

5362: Realizing Field-Ready MEMS Gravimetry
Abhinav Prasad, Elizabeth Passey, Karl Toland, Kristian Anastasiou, Douglas Paul, Giles Hammond
University of Glasgow, United Kingdom

5480: Study on Terahertz Conductivity Sensing Based on Laser-Induced Diamond Carbonization
Xun Zhao{2}, Rui You{2}, Xiaomeng Bian{2}, Yiling Lian{3}, Ji Huang{1}, Misheng Liang{2}
{1}Institute of Ionizing Radiation Metrology, China National Institute of Metrology, China; {2}Laboratory of Intelligent Microsystems, Beijing Information Science and Technology University, China; {3}University of Hong Kong, China

5532: Enhanced Detection of Individual Gas Bubbles in Multiphase Flow by Distributed Acoustic Sensing
Yannik Schick{1}, Lukas A. Pichler{2}, Mark W. Hlawitschka{2}, Marco J. Da Silva{2}
{1}Institute of Measurement Technology, Johannes Kepler University Linz, Austria; {2}Johannes Kepler University Linz, Austria

5536: Robust Visual-Inertial Odometry with Pedestrian Dead Reckoning Under Vision-Degraded Conditions
Sohee Park, Hanyeol Lee, Chan Gook Park
Seoul National University, Korea

5691: Microwave Displacement Sensing of Automatic Trolling Motor Based on Optically Transparent Antenna
Kam-Weng Tam{4}, Paulo Olavo Lima Neves Oliveira{3}, Sio-Hon Pan{1}, Wenhai Zhang{2}
{1}Macao Science Centre, Macau; {2}Soochow University, China; {3}University of Macau, Macau; {4}University of Macau & Macao Science Centre, Macau

5709: Batteryless UHF-RFID Memory-Enabled Sensor for the Detection of Entry Point Openings
Mahdi Barati, Mohammadesmaeil Akbarpour, Rashid Mirzavand
University of Alberta, Canada

5721: Ultimate Limits of Charge Detection of Molecular Nanoscale Dipoles Using Single-Electron Transistors
Gergo Szakmany{2}, Enrique Blair{1}, Alexei Orlov{2}, Istiaque Rahaman{2}, Gregory Snider{2}
{1}Baylor University, United States; {2}University of Notre Dame, United States

5897: Performance and Applications of a 128 MHz Low Power Oscillator Based on Micromachined Quartz Resonator
Srinivas Tadigadapa{1}, Yogesh Gudi{1}, Kailand Harrison{1}, Nishit Goel{2}, Aatmesh Shrivastava{1}
{1}Northeastern University, United States; {2}TUC, TDK-InvenSense, United States

5912: Machine Learning Models for Classifying Tomato Plants Exposed to Metal Nanoparticles Through Reflectance Spectroscopy
Felipe Hornung{3}, Walter Flores{3}, Katia Ribas{1}, André Eugenio Lazzaretti{2}, Marcia Muller{2}, Jose Fabris{2}
{1}Federal University of Paraná, Brazil; {2}Universidade Tecnológica Federal do Paraná, Brazil; {3}UTFPR, Brazil

5919: In-Home Human Activity Recognition via Kinematics-Focused Multi-Modal Sensor Fusion and Spatio-temporal Neural Architecture
Seyyed Mahdi Torabi, Edward Park, Mohammad Narimani
Simon Fraser University, Canada

14:30-16:00
Posters: Physical Sensors 5
Session Chair: Yi Chiu
Room: Pre-Function Area

5031: Embedded Temperature Sensing in Li-Ion Battery Pouch Cells - Dependence of Cell Orientation and Sensor Location on Measurement Variability
Sajitha Sunil{2}, Timothy Vincent{2}, James Marco{2}, Pierre Kubiak{1}
{1}National Physical Laboratory, United Kingdom; {2}University of Warwick, United Kingdom

5120: Investigation of Gravity and Pressure Effects on MEMS Thermal Wind Sensors
Wenjing Zhu{2}, Sicun Duan{2}, Zhenxiang Yi{2}, Ming Qin{2}, Qing-An Huang{1}
{1}Key Laboratory of MEMS of the Ministry of Education, Southeast University, China; {2}Southeast University, China

5122: 3D-Printed Multiaxial Force Sensor Enabling Single-Step Sensor Integration
Felix Herbst, Bastian Latsch, Edwin Peng, Sven Suppelt, Nils Demuth, Christoph Haugwitz, Mario Kupnik
Technische Universität Darmstadt, Germany

5139: An Optical MEMS Sensor for Dynamic Wall Shear Stress Measurement in Complex Flow
Yunjian Chen, Yunzhe Liu, Daoyuan Wang, Shengming Ma, Chuqiao Wang, Lei Shi, Yipeng Yang, Xingxu Zhang, Binghe Ma
Northwestern Polytechnical University, China

5141: Compact 3D Airflow Vector Sensor Using Multiple MEMS Differential Pressure Sensors and Neural Network-Based Estimation
Ryusei Ando, Hidetoshi Takahashi
Keio University, Japan

5173: A Highly Sensitive Microwave Angular Displacement Sensor Based on Three-Path Transversal Signal Interference Principle
Kam-Weng Tam{3}, Desen Li{2}, Sio-Hon Pan{1}, Chi-Hou Chio{2}, Ngai Kong{2}
{1}Macao Science Centre, Macau; {2}University of Macau, China; {2}University of Macau, Macau; {3}University of Macau & Macao Science Centre, Macau

5202: Temperature Monitoring in High-Power Electrical Contacts Using Thin-Film Sensors
Christina Pongratz{1}, Anna Schott{1}, Christian Seiler{2}, Tim Vorwerk{2}
{1}Fraunhofer Institute for Surface Engineering and Thin Films IST, Germany; {2}Fraunhofer Institute for Transportation and Infrastructure Systems IVI, Germany

5205: Hybrid Thermal and Mechanical 2D Anemometer Using Strain-Induced Out-of-Plane Cantilevers
Victor Winnen{1}, Thomas Hackett{2}, Jarno Groenesteijn{1}, Dennis Alveringh{2}
{1}Bronkhorst High-Tech B.V., Netherlands; {2}University of Twente, Netherlands

5223: Comparative Evaluation of Mechanical Performance of pMUT with Different Membrane Diameters in PZT and ScAlN30%
Luigi Barretta{2}, Rossana Scaldaferri{2}, Alessandro Stuart Savoia{3}, Yul Koh{1}, Carlo Luigi Prelini{2}, Sagnik Ghosh{1}, Andrea Di Matteo{2}, Alessi Enrico{2}, Domenico Giusti{2}
{1}IME, Agency for Science, Technology and Research, Singapore; {2}STMicroelectronics, Italy; {3}Università degli Studi Roma Tre, Italy

5231: Differential TMR-Based Multiaxial Force Sensor Using Soft Magnetoelastic Composites
Mark Suppelt, Hao Ninh, Julian Seiler, Kilian Schäfer, Felix Herbst, Muhammad Bilal Khan, Matthias Lutzi, Bastian Latsch, Stephan Rinderknecht, Oliver Gutfleisch, Mario Kupnik
Technische Universität Darmstadt, Germany

5831: Corrugated Glass Diaphragm Differential Pressure Sensor Using Sampling Moiré Method
Takao Nakajima, Ohga Nomura, Ryo Oda, Takuto Kishimoto, Toshihiro Shiratori, Kyota Shimada, Ryusei Ando, Hidetoshi Takahashi
Keio University, Japan

5856: Low-Frequency Strain Testbed for Das Performance Characterization
Guilherme Heim Weber{2}, Emmanuell Scolimoski{2}, Danilo Fernandes Gomes{2}, Beatriz Brusamarello{2}, Eduardo Henrique Dureck{2}, Daniel Rodrigues Pipa{2}, Jean Carlos Cardozo Da Silva{2}, Manoel Feliciano Da Silva Junior{1}, Sergio Taveira de Camargo Júnior{1}, Cicero Martelli{2}
{1}Petrobras Research and Development Program, Brazil; {2}Universidade Tecnológica Federal do Paraná, Brazil

5913: Monitoring Progression of Diabetic Foot Ulcer-a Phantom Study Using Distributed Sensors and Near Field Microwave Radiometry
Shabeeb Ahamed Kp{2}, Jeslin P Issac{3}, Kavitha Arunachalam{1}
{1}Indian Institute of Technology Madras, India; {2}SRM Institute of Science and Technology, India; {3}University of Glasgow, United Kingdom

5924: 2.77 kV/m/s2 Sensitivity Digital Demodulator-Decimator-Filter on Xilinx Spartan-7 FPGA for sub-Hz Aerospace Nano-Gravimetry Accelerometers down to 10 nm/s2
Mattia Tambaro{1}, Fabio D'Ottavi{2}, Marcello De Matteis{1}
{1}Università degli Studi di Milano-Bicocca, Italy; {2}Università degli Studi di Milano-Bicocca / Università degli Studi di Pavia, Italy

14:30-16:00
Posters: Wearable Sensors & Systems
Session Chair: Mark Cheng
Room: Pre-Function Area

5064: A Multi-Modal Electromyography and Force Myography Sensor for the Purpose of Upper Limb Prosthesis Integration
Peyton Young{2}, Marcus Battraw{1}, Morgan Finley{2}, Jonathon Schofield{2}
{1}California State University, Chico, United States; {2}University of California, Davis, United States

5070: Simulation and Experimental Comparison of Sensing Approaches for Capacitive Eye Tracking
Giulia Palmieri{2}, Alberto Pettenella{1}, Luca Merigo{1}, Marco Carminati{2}
{1}EssilorLuxottica, Italy; {2}Politecnico di Milano, Italy

5153: End-to-End Efficiency in Keyword Spotting: A System-Level Approach for Embedded Microcontrollers
Pietro Bartoli{2}, Tommaso Bondini{2}, Christian Veronesi{2}, Andrea Giudici{2}, Niccolò Antonello{1}, Franco Zappa{2}
{1}Essilorluxottica, Italy; {2}Politecnico di Milano, Italy

5175: A Novel Wearable-Based Fetal Movement Localization System Using Machine Learning
Kianoosh Kazemi{2}, Mohammad Feli{2}, Arman Anzanpour{2}, Susanna Likitalo{2}, Valerio Beni{1}, Christian Jonasson{1}, Anna Axelin{2}, Pasi Liljeberg{2}
{1}RISE, Research Institutes of Sweden AB, Sweden; {2}University of Turku, Finland

5225: Femtosecond Laser Induced Graphene/MoS_2 Flexible Pressure Sensors for Human–Robot Kinematic Detection
Fan Wu, Misheng Liang, Chaoqi Zhang, Yingjie Chen, Haibo Xu, Rui You
Laboratory of Intelligent Microsystems, Beijing Information Science and Technology University, China

5242: Assessing Photoplethysmogram (PPG) Signal Quality Across Participant Groups and Settings
Jason Fu, Saud Lingawi, Jacob Hutton, Jim Christenson, Babak Shadgan, Brian Grunau, Calvin Kuo, Mahsa Khalili
University of British Columbia, Canada

5393: PVDF Fused Nanocomposite for Piezoelectric Applications
Aniket Chakraborthy, Ananya Mukherjee, Suresh Nuthalapati, Anindya Nag, M Ercan Altinsoy
Technische Universität Dresden, Germany

5406: A Wearable System for Continuous Physiological Data Collection Towards Real-Time Analysis of Psychological Well-Being
Alec Brewer{1}, Emily Garceau{1}, Idil Baran{3}, James Dieffenderfer{1}, Maria Davila{2}, Danielle Roubinov{3}, Aysenil Belger{3}, Alper Bozkurt{1}
{1}North Carolina State University, United States; {2}Research Triangle Institute, United States; {3}University of North Carolina, United States

5411: Bioimpedance-Driven Haptic Feedback for Human-Computer Interaction
Tianyang Yao{2}, Richard Bayford{1}, Andreas Demosthenous{2}
{1}Middlesex University, United Kingdom; {2}University College London, United Kingdom

5412: Wearable Sweat-Based Ion-Selective Sensor for Continuous Monitoring of Hydration
Gustavo A. Medina, Luis F. Rodriguez, Jorge Manrique Castro
University of Texas at El Paso, United States

5461: A 3D-Printed Torque Sensor with Integrated Transmission for Powered Orthosis
Matteo Piratoni, Ilaria Mileti, Fabrizio Patanè
Niccolò Cusano University, Italy

5560: A Smart Insole with Integrated Perfusion Monitoring and Electrical Stimulation for Enhancing Diabetic Foot Ulcer Healing
Anthony Hanson{2}, Masoud Panahi{2}, Simin Masihi{2}, Dinesh Maddipatla{2}, Alimohammad Adineh{2}, Binu Narakathu{2}, Daryl Lawson{1}, Massood Atashbar{2}
{1}University of Nevada Reno, United States; {2}Western Michigan University, United States

5573: Characterization of a Wearable Multi-Sensor Breathing Device
Bhawya Bhawya, Misk Damdoum, Masa Damdoum, Afra Siddiqa, Brooke R Shepley, Anthony R Bain, Simon Rondeau-Gagné, Mohammed Jalal Ahamed
University of Windsor, Canada

5581: Muscle Activity Monitoring via Mechanomyography Using Soft 3D-Printed Piezoelectric Sensors
Mark Suppelt{2}, Bastian Latsch{2}, Julian Seiler{2}, Farah N. Mansour{2}, Felix Herbst{2}, Stephan Schaumann{2}, Sven Suppelt{2}, Steffen Graffe{2}, Philipp Beckerle{1}, Mario Kupnik{2}
{1}Friedrich-Alexander University of Erlangen-Nuremberg, Germany; {2}Technische Universität Darmstadt, Germany

5590: Laser-Induced Graphene/PDMS Soft Pressure Sensors for Detecting Low-Pressure Variations in Sports Garments
Mohammad Amin Amindehghan{2}, Rudolf Seethaler{2}, Farzan Gholamreza{2}, Adrian Lai{1}, Abbas S. Milani{2}
{1}Lululemon athletica, Canada; {2}University of British Columbia, Canada

5635: Grasp Type Classification Using a Capacitive Bending Sensor Toward Hand Assistive Robots
Toshihito Ohashi{2}, Shima Okada{2}, Naruhiro Shiozawa{2}, Daisuke Goto{1}, Tatsuya Kobayashi{2}
{1}National Institute of Advanced Industrial Science and Technology, Japan; {2}Ritsumeikan University, Japan

5684: Detecting Respiratory Tract Infections Using Wearable Devices: Assessing the Impact of Study Parameters in Real-World Applicability
Inka Mustajoki, Katri Karhinoja, Matti Kaisti
University of Turku, Finland

5694: FlexGlove: Grasp-Based 3D Object Reconstruction Using Wearable Sensors
Nanda Mitra Pammi, Mohit Jagini, Madhav Rao
International Institute of Information Technology Bangalore, India

5466: Comparative Waveform Analysis of Nose and Finger PPG Signals for Non-Invasive Blood Pressure Estimation
Alice Scandelli{2}, Costanza Cenerini{2}, Ilaria Crupi{2}, Federica Mozzini{2}, Sarah Solbiati{2}, Enrico Gianluca Caiani{2}, Diana Trojaniello{1}, Federica Villa{2}
{1}EssilorLuxottica, Italy; {2}Politecnico di Milano, Italy

5927: A Wearable Graphene-Based Sweat Sensor for Real-Time Health Monitoring
Lavanya Rani Ballam{2}, Hossein Cheraghi Bidsorkhi{1}, Alessandro Giuseppe D'Aloia{1}, Maria Sabrina Sarto{1}
{1}DIAEE - Sapienza University of Rome, Italy; {2}Sapienza University of Rome, Italy

14:30-16:00
Posters: Advances in Sensor Phenomenology, Modeling, & Applications 2
Session Chairs: Charusluk Viphavakit, Arum Han
Room: Pre-Function Area

5024: Mutual Closed-Loop Compensation of Hardening and Softening Nonlinearities in MEMS Capacitive Resonators
Christian Padovani{1}, Gabriele Gattere{2}, Paolo Frigerio{1}, Giacomo Langfelder{1}
{1}Politecnico di Milano, Italy; {2}STMicroelectronics, Italy

5210: Pressure Sensing and Multi-Resolution Kinetic Modeling of Oxygen-Releasing Compounds
Abhishek Sharma{1}, Vanessa Barth{1}, Henning J. Jessen{1}, Laura Maria Comella{2}
{1}Albert-Ludwigs-Universität Freiburg, Germany; {2}Hochschule Karlsruhe - HKA, Germany

5235: Multi-Axial Sensing in Composite Laminates via Integrated FBG and OFDR: Unveiling Anticlastic Curvature
Giancarlo Santamato{1}, Sebastian San Martín{2}, Lorenzo Tozzetti{1}, Fabrizio Di Pasquale{1}
{1}Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna, Italy; {2}Universidad Técnica Federico Santa Maria, Chile

5345: Ceramic Resonator Probe for Milk Adulteration Detection: A Simple and Scalable Sensing Solution
Fernanda Ribeiro Destro, Bruno Cepeda Heriques, Mateus Isaac de Oliveira Souza, Vinicius Marrara Pepino, Ben-Hur Viana Borges
Universidade de São Paulo, Brazil

5354: Multispectral Capacitance Imaging of Single Red Blood Cells: Experiments and Simulations
Daniele Goldoni, Jacopo Nicolini, Luigi Rovati, Luca Selmi
Università degli Studi di Modena e Reggio Emilia, Italy

5470: Evolutionary Algorithms for Equivalent Circuit Modeling of PVDF-TrFE–Batio$_3$ Piezoelectric Sensors: A Feasibility Study
Annesha Mazumder{3}, Qinrong He{2}, Ensieh Hosseini{2}, Hamida Hallil{1}
{1}CNRS, IMS, UMR 5218, Bordeaux INP, University of Bordeaux, France; {2}Durham University, United Kingdom; {3}Université de Bordeaux, France

5601: Decomposing Sensor Transfer Functions for Compensation Algorithm Design in Resource-Constrained Settings
Gustav Bohlin, Cheng Yang, Tobias J. Oechtering
KTH Royal Institute of Technology, Sweden

5554: Portable Multi-Sensor System for Detection of VOC Biomarkers in Diabetes
Wisarn Patchoo{1}, Sirada Janjaochay{2}, Charusluk Viphavakit{2}
{1}Bangkok University, Thailand; {2}Chulalongkorn University, Thailand

14:30-16:00
Posters: Sensor Networks & IoT 2
Session Chairs: Brendan O'Flynn, Sebastian Bader
Room: Pre-Function Area

5022: Heterogeneous Sensor Networks: Challenges and Insights from an Industrial Scenario
Nicolas Winkler{1}, Patrick Neumann{1}, Erik Schaffernicht{2}, Achim J. Lilienthal{3}
{1}Bundesanstalt für Materialforschung und -prüfung, Germany; {2}Örebro University, Sweden; {3}Technische Universität München, Germany

5029: A 30 nW Inductor-Free Self-Powered Asynchronous Energy Extraction Circuit for Miniaturized Electromagnetic Vibration-Power Generators
Shiyuan Sun, Takeaki Yajima
Kyushu University, Japan

5127: Low-Power Preamble-Less Wireless Communication Method with Two Tone Signals
Hironao Okada
National Institute of Advanced Industrial Science and Technology, Japan

5371: Enhanced Radio Map for Wi-Fi Fingerprinting Using PDR and Particle Filter
Teresa Serrano-Sala, Joaquin Torres Sospedra
Universitat de València, Spain

5577: Assessment of School Building Performance via Using Occupancy-Generated Carbon Dioxide
Fabian Sievers{2}, Nils Langer{2}, Sybille Braungardt{2}, Álvaro Ortiz-Pérez{2}, Stefan Palzer{1}
{1}Professorship for Sensors, Technische Universität Dortmund, Germany; {2}Technische Universität Dortmund, Germany

5587: Experimental Performance Analysis of DOA Estimation Algorithms
Michael Ta{2}, Laurie Conteville{1}, Elizabeth Colin{1}, Jean Marc Laheurte{3}, Jimmy Leszczynski{3}, Benoit Poussot{3}
{1}Efrei Research RLab, EFREI, Paris-Panthéon-Assas University, France; {2}Efrei Research RLab, Gustave Eiffel University, CNRS, ESYCOM, France; {3}Université Gustave Eiffel, CNRS, ESYCOM, France

5600: AI-Based Latency Optimization in ORAN for IoT Sensor Networks
Shruthigna Chandupatla, Mohammed Ali
University of Texas at Dallas, United States

16:00-17:00
Biosensing Platforms
Session Chairs: Hyejin Moon, Yoshikazu Hirai
Room: Kitsilano A

16:00
5489: Reversibly Morphing Carbon Nanotube Fiber Sensor for Real-Time, Minimally Invasive Monitoring of Hepatic ROS Levels
Yixin Zhao{2}, Yue Zhou{2}, Shanshan Zhang{2}, Yiming Wei{2}, Lu Fang{1}, Bo Liang{2}
{1}HangZhou DianZi University, China; {2}Zhejiang University, China

16:15
5291: Quantification of Cellular Stress Responses via Intracellular and Extracellular Fluorescence Biosensors
Shirin Parvin, Zheyuan Zhang, Zengyi Shao, Deon Ploessl, Meng Lu
Iowa State University, United States

16:30
5105: Real-Time Droplet Meniscus Recognition and Demonstration on an Operating EWOD Digital Microfluidics System
Negar Danesh, Hyejin Moon
University of Texas at Arlington, United States

16:00-17:00
Microplastic Sensors: Emerging Approaches for Rapid & Portable Solutions
Session Chairs: Selim Hanay, Filipe Alves
Room: Kitsilano B

16:00
5665: Nanoplastic Identification and Quantification with Nanoelectromechanical System-Based Fourier Transform Infrared Spectroscopy: NEMS-FTIR (INVITED)
Jelena Timarac-Popović{2}, Johannes Hiesberger{1}, Eldira Šesto{2}, Niklas Luhmann{1}, Ariane Giesriegl{2}, Hajrudin Bešić{2}, Josiane Pénélope Lafleur{1}, Silvan Schmid{2}
{1}Invisible–Light Labs GmbH, Austria; {2}Technische Universität Wien, Austria

16:30
5181: Field-Deployable Plasmonic Sensing and Machine Learning Classification of Microplastics Using Peptide–AuNP Conjugates
Abbas Motalebizadeh, Somayeh Fardindoost, Mina Hoorfar
University of Victoria, Canada

16:45
5565: A Quantum Neural Network Algorithm for Microplastic Identification Using Raman Signatures Collected During Field Tests
Xinyu Zhang, Cheng-Hao Yu, Leixin Ouyang, Rong Fu, Lina Pu, Mark Ming-Cheng Cheng
University of Alabama, United States

16:00-17:00
Actuators & Energy Harvesters
Session Chairs: Darrin Young, Pai-Yen Chen
Room: Kitsilano C

16:00
5568: A Review of Recently Developed Piezoelectric MEMS Microspeakers (INVITED)
Rong Fu, Xinyu Zhang, Leixin Ouyang, Tauhidul Haque, Rui Feng, Mark Ming-Cheng Cheng
University of Alabama, United States

16:30
5150: Evaluation of Acoustic Energy Transfer Through Bolted Connections for Sensor Integrating Machine Elements
Dirk Leiacker{2}, David Riehl{2}, Timo Oster{2}, David Witulla{2}, Mark Suppelt{2}, Felix Herbst{2}, Julian Peters{1}, Sven Matthiesen{1}, Mario Kupnik{2}, Klaus Hofmann{2}
{1}Karlsruhe Institute of Technology, Germany; {2}Technische Universität Darmstadt, Germany

16:45
5656: A Sliding Mode Triboelectric Nanogenerator (TENG) Based on Screen-Printing Technique
Sam Ali, Dinesh Maddipatla, Anthony Hanson, Bradley Bazuin, Massood Atashbar
Western Michigan University, United States

16:00-17:00
Data Processing & AI for Imaging Applications
Session Chairs: Youngwook Kim, André Lazzaretti
Room: Kitsilano D

16:00
5358: PicoSAM2: Low-Latency Segmentation In-Sensor for Edge Vision Applications
Pietro Bonazzi{1}, Nicola Farronato{2}, Stefan Zihlmann{1}, Haotong Qin{1}, Michele Magno{1}
{1}ETH Zürich, Switzerland; {2}IBM Research, ETH Zürich, Switzerland

16:15
5598: Lunar Rock Reconstruction with RGB-D Images
Yiyan Ruan, Erik Komendera
Virginia Polytechnic Institute and State University, United States

16:30
5330: Real-Time Surface Classification and Crack Enumeration on Underwater Metallic Structures Using DenseNet201 and YOLOv8
Mohammad Arif Khan, Shunham Saurav, Kaushik Bandyopadhyay, Avishek Adhikary
Indian Institute of Technology Bhilai, India

16:45
5487: GPT4Rehab: AI-Based Upper-Limb Rehabilitation Trainer with Stereo Cameras
Haoyan Liu
ABB Inc / ABB US Corporate Research Center, United States

16:00-17:00
Sensor Processing Systems
Session Chair: Avishek Adhikary
Room: Fairview I & II

16:00
5792: A Novel Localized Coherence Rule Delay-and-Multiply Algorithm Toward Long-Range Ultrasound Imaging with Narrow Field-of-View pMUTs (INVITED PRE-PUBLISHED JOURNAL PAPER)
Gaia Giubilei{2}, Mantalena Sarafianou{1}, David Sze Wai Choong{1}, Duan Jian Goh{1}, Yul Koh{1}
{1}IME, Agency for Science, Technology and Research, Singapore; {2}Politecnico di Torino, Italy

16:15
5820: Development of a Sound-Based Smart Inhaler with a Mechanical Acoustic Filter for Medication Identification (INVITED PRE-PUBLISHED JOURNAL PAPER)
Mou-Wei Chang{4}, Fang-Hao Hsiao{4}, Yong-Jyun Lin{4}, Chun-Wei Chiu{4}, Wei-Chen Chen{4}, Hsuan-Yu Chen{1}, Wen-Jui Wu{2}, Mingsian R. Bai{3}, Yu-Te Liao{4}
{1}Academia Sinica, Taiwan; {2}Mackay Memorial Hospital, Taiwan; {3}National Tsing Hua University, Taiwan; {4}National Yang Ming Chiao Tung University, Taiwan

16:00-17:00
Sensor Systems 2
Session Chair: Vihar Georgiev
Room: Fairview V

16:00
5812: Embedded, Multimodal (TEER, EIS, Transparency) Sensing Chips for in Vitro Cellular Models
Surbhi Tidke{1}, Maria Tregansin{1}, Joseph Potter{1}, Chris Hatcher{2}, Adrienne Watson{2}, Swaminathan Rajaraman{1}
{1}University of Central Florida, United States; {2}World Precision Instruments, United States

16:15
5813: Time Constant Estimation on a Low-Cost, Low-Power Microcontroller Using the Matrix Pencil Method
Kelly Tou, Titan Yuan, Kristofer Pister
University of California, Berkeley, United States

16:30
5821: Utilization of Programmable I/O of RP2350 Microcontroller with CMOS SPAD Sensors
Tuomo Talala{1}, Marko Pakaslahti{1}, Tore Leikanger{2}, Ilkka Nissinen{1}, Jan Nissinen{1}
{1}University of Oulu, Finland; {2}University of Oulu / Nordic Semiconductor OY, Finland

16:45
5844: Next-Generation Passive Sensing of Hazardous Liquid Dispersion Events Using Frequency-Selective Surfaces
Fatemeh Niknahad{2}, Pau Casacuberta{1}, Ali Maleki Gargari{2}, Ferran Martín{1}, Mohammad Zarifi{2}
{1}CIMITEC, Universitat Autònoma de Barcelona, Spain; {1}CIMITEC, Universitat Autònoma de Barcelona, Canada; {2}University of British Columbia, Canada

16:00-17:00
Wearable Sensors 2
Session Chair: Paul C.-P. Chao
Room: Granville

16:00
5058: A Novel Wireless, Wearable Potentiostat for On-Body Electrochemical Sensing
Marco Sica, Md Rasel, Brendan O'Flynn, Hassan Hamidi, Daniela Iacopino
Tyndall National Institute, Ireland

16:15
5570: Wearable Integrated Multi-Sensor Modality for Real-Time Health Monitoring
Aiman Mahar, Dro Boodaghian, Alessandro G. D'aloi, Hossein C. Bidsorkhi, Maria S. Sarto
Sapienza – Università di Roma, Italy

16:30
5632: Highly Sensitive P(VDF-TRFE)/Carbon Black Nanocomposite Pressure Sensor for Sub-kPa Detection
Lavanya Muthusamy, Goutam Koley
Clemson University, United States

16:45
5322: A Parallel Ultra-Low Power Silent Speech Interface Based on a Wearable, Fully-Dry EMG Neckband
Fiona Meier, Giusy Spacone, Sebastian Frey, Luca Benini, Andrea Cossettini
ETH Zürich, Switzerland

16:00-17:00
Physical Sensors 3
Session Chair: Ravi Prakash
Room: Cambie

16:00
5730: Temperature Dependent Modeling of Silicon Strain Gauge-Based Pressure Sensors for Automotive
Jihyun Lee, Hojoon Lee, Hyunchul Sagong
Korea Automotive Technology Institute, Korea

16:15
5734: High-Frequency Low-Power Micro-Fluxgate
Jiri Maier{1}, Pavel Ripka{1}, Poki Chen{2}
{1}Czech Technical University in Prague, Czech Rep.; {2}National Taiwan University of Science and Technology, Taiwan

16:30
5746: Experimental Demonstration of Optical Excitation of a Dual-Shell Resonator
Lois Meira Lopez, Melika Momenzadeh, Maxim R. Shcherbakov, Andrei M. Shkel
University of California, Irvine, United States

16:45
5814: Sampling Moiré Method-Based Weight Scale Utilizing Dual-Pitch Stripe Pattern for High Resolution and Wide Range
Maya Kurihara, Takuto Kishimoto, Kyota Shimada, Ryusei Ando, Ohga Nomura, Toshihiro Shiratori, Hidetoshi Takahashi
Keio University, Japan

8:30-10:00
Posters: Microelectronic & Health Sensor Systems
Session Chairs: Masoud Agah, Lars Martin
Room: Pre-Function Area

5228: A Digitized Thermal Conductivity Measurement System for 3-Omega Sensors
Ethan Garnier{2}, Brandon Brown{1}, Chris Rouse{2}
{1}IEEE Member, Canada; {2}University of New Brunswick, Canada

5314: Screening Alzheimer's Disease Biomarkers Using a Portable Antibody Functionalized Bioanalyzer Platform and Novel Saliva Testing Strategies
Hussain Ali, Srishti Johri, Christopher Semaan, Ravi Prakash
Carleton University, Canada

5355: Sensing High Speed Response of Plants to Transient Water Stress
Mayank Barad, Rich Howard, Aggelos Bletsas
Rutgers, The State University of New Jersey, United States

5435: Noise Suppression in MEMS and FOG Gyros Through an Adaptive Threshold Wavelet Algorithm
Pedro Bossi Núñez, Ludovico Dindelli, Teresa Natale, Francesco Dell'Olio
Politecnico di Bari, Italy

5612: Model-Free Sensor Fault Detection in Lithium-Ion Battery Packs Under Unknown Charging Conditions Using Sensor-to-Sensor Dynamics
Mohammad Al Saaideh{2}, Khaled Aljanaideh{1}, Lihong Zhang{2}, Mohammad Al Janaideh{3}
{1}Jordan University of Science and Technology, Jordan; {2}Memorial University of Newfoundland, Canada; {3}University of Guelph, Canada

5652: A Smart Helmet Sensor System for Continuous Monitoring of Transient Impact Events in Low Power Modes
Chandrashekhar Choudhary, Tianshuo Wang, Aakash Jeyakanthan, Jacob Romer, Shloka Shah, Mohammad Islam, Eric Nauman, Jing Shi, Tao Li
University of Cincinnati, United States

5705: A High Sensitivity, Low Noise Interface for Amperometric Electrochemical Hydrogen Sensors
Shuaishuai Ling, Foster Caragay, Hongwei Qu
Oakland University, United States

5726: Shape Sensing of Continuum Manipulator Using Sliding Resistive Flex Sensors
Chenhan Zhang{2}, Shaopeng Jiang{4}, Heyun Wang{1}, Joshua Liu{2}, Amit Jain{3}, Mehran Armand{2}
{1}Biomechanical and Image-Guided Systems Laboratory, LCSR, Johns Hopkins University, United States; {2}Institute for Integrative and Innovative Research, University of Arkansas, United States; {3}Johns Hopkins School of Medicine, United States; {4}Reconfigurable Robotics Laboratory, École Polytechnique Fédérale de Lausanne, Switzerland

8:30-10:00
Posters: Physical Sensors 6
Session Chair: Alan O'Riordan
Room: Pre-Function Area

5256: Simulating Gadolinium-Induced Magnetic Field Variations for Temperature Sensing with Magneto-Mechanical Resonators
Jonas Faltinath{2}, Miriam Schmitz{1}, Fynn Foerger{2}, Martin Möddel{2}, Tobias Knopp{2}
{1}Technische Universität Hamburg, Germany; {2}Universitätsklinikum Hamburg-Eppendorf, UKE / Technische Universität Hamburg, Germany

5273: Bridging the Gap: Enhancing Hall Device Performance Across Planar and Vertical Structures
Ping Zheng, Enghuat Toh, Qingyou Wang, Zintun Thant, Jerry Joseph James, Guoquan Teo, Elgin Quek, Jan Hoentschel
Globalfoundries, Singapore

5297: Inductive Distance Sensor for Narrow Spaces: Application in Total Knee Arthroplasty
Hyunjoon Hwang, Sebin Kim, Yongnam Song
Korea University, Korea

5338: CMOS-Integrated Capacitive Tactile and Optical Sensors for Multi-Axis Force and Proximity Sensing
Cheng-Ching Chao, Yong-Teng Liu, Ching-Yu Lai, Michael Lu
National Tsing Hua University, Taiwan

5339: Flexible Piezoelectric Sensor Array with CMOS Integration for High-Resolution Tactile Mapping
Po-Jui Ku, Ching-Yu Lai, Yong-Teng Liu, Michael Lu
National Tsing Hua University, Taiwan

5343: Fluxgate Magnetometer Signal Processing Using a Single-Chip Microcontroller
Vojtěch Petrucha, Šimon Ondřej
Czech Technical University in Prague, Czech Rep.

5413: Integrated Bioelectronic Platform Utilizing PEDOT:PSS Strain Sensors for Real-Time Mechanostimulation and Sensing
Zhuji Qu, Jongyun Kim, Haolan Sun, Longlong Li, Dong-Weon Lee
Chonnam National University, Korea

5448: The Influence of Coil Stray Capacity on the Sensitivity and Useful Bandwidth of Induction-Based and GMI Magnetic Sensors
Miao Xu, Aktham Asfour
Université Grenoble Alpes, CNRS, G2elab, Grenoble INP, France

5493: SLSP-Based Sensors for Ceramic Dielectric Characterization Under Pressure
Hao Xu{1}, Yujie Hua{1}, Mengmeng Yang{2}, Kun Liu{2}, Gang Shao{2}, Wenxuan Tang{1}
{1}Southeast University, China; {2}Zhengzhou University, China

5510: Layer-by-Layer Assembled TiO_2 Coated Hetero-Core Optical Fiber Sensor for High-Temperature Sensing via Lossy Mode Resonance
Masahiko Kuroiwa, Kodai Kikuchi, Michiko Nishiyama, Kazuhiro Watanabe, Junichi Ida
Soka University, Japan

5840: Identification and Quantification of Common Adulterants in Extra Virgin Olive Oil Using Microwave Dielectric Spectroscopy Aided by Feedforward Neural Networks (INVITED PRE-PUBLISHED JOURNAL PAPER)
Julio Cesar Picolo Alarcon, Mateus Isaac Oliveir Souza, Vinicius Marrara Pepino, Ben-Hur Viana Borges
Universidade de São Paulo, Brazil

5907: Linearity Range Enhancement of LVDT Position Sensors Using Optimized Coils (INVITED PRE-PUBLISHED JOURNAL PAPER)
Mehran Mirzaei, Jiri Maier, Pavel Ripka
Czech Technical University in Prague, Czech Rep.

5926: A Pair of SAW Devices-Based Viscosity Measurement for a Small Amount of Sample Volume
Anjam Waheed{5}, Kenji Sakamoto{2}, Tsunemasa Saiki{3}, Satoshi Amaya{4}, Riyanarto Sarno{1}, Tadao Matsunaga{5}, Sang-Seok Lee{5}
{1}Institut Teknologi Sepuluh Nopember, Indonesia; {2}Kyushu Institute of Technology, Japan; {3}The University of Fukuchiyama, Japan; {4}The University of Tokyo, Japan; {5}Tottori University, Japan

8:30-10:00
Posters: Microfluidics & Biosensors 2
Session Chair: Noriko Tsuruoka
Room: Pre-Function Area

5107: Micromixer-Integrated Triboelectric Microfluidic Biosensor for Blood Coagulation Monitoring
Jia-Cheng Lin{1}, I-Chang Su{2}, Yong-Kwang Tu{2}, Yu-Jui Fan{2}, Horn-Jiunn Sheen{1}, Kuang-Chong Wu{1}
{1}National Taiwan University, Taiwan; {2}Taipei Medical University, Taiwan

5121: Facile Method to Evaluate Antimicrobial Activity Based on Microbial Respiration
Dongkyu Lee, Chanyong Park, Ohwon Kwon
Korea Institute of Machinery and Materials, Korea

5188: Minimally Invasive Measurement of Phloem Sucrose Content Using Microperfusion Needles
Yang Ye{2}, Ayari Koga{2}, Noriko Tsuruoka{1}, Mitsuru Tsubo{2}, Eiji Nishihara{2}, Koutoku Ohmi{2}, Sang-Seok Lee{2}, Tadao Matsunaga{2}
{1}Tohoku University, Japan; {2}Tottori University, Japan

5289: Aerosol Jet Printing of Tissue Factor on Gold Electrodes for Dielectric Blood Coagulometry
Emily Song, Dante Disharoon, Hanif Alizadeh, Christopher Delianides, Changyong Cao, Anirban Sen Gupta, Pedram Mohseni, Michael Suster
Case Western Reserve University, United States

5454: An Eletrochemical Fiber Sensor for Implantable Detection of Serotonin and Dopamine in Brain
Yue Zhou, Yixin Zhao, Shanshan Zhang, Zhongyi Xu, Junhao Li, Bo Liang
Zhejiang University, China

5609: Microfluidic Chip with Cobalt Oxide-Modified Laser-Scribed Graphene Electrodes for Non-Enzymatic Glucose Detection from Urine Samples
Mario Soto Martinez, Abdullah Bukhamsin, Nadia Houti, Khaled Nabil Salama
King Abdullah University of Science and Technology, Saudi Arabia

5920: Enhancing Lateral Flow Device Design for Multiplexed Plasmonic Biosensing of Inflammatory Biomarkers
Zoe Bradley{2}, Sara McNamee{2}, Sam Fishlock{1}, Nikhil Bhalla{2}, Tara Moore{2}, James McLaughlin{2}
{1}Tedi London, United Kingdom; {2}Ulster University, United Kingdom

5928: High-Performance CNT-Based FETs on 200 mm Si Wafers with Low Drift and aM-Level Biosensing Sensitivity
Leticia Alves Da Silva, Martin Hartmann, Simon Böttger, Sascha Hermann
TU Chemnity, Germany

8:30-10:00
Posters: Sensor Materials, Fabrication & Packaging 2
Session Chairs: Sharmistha Bhadra, Dong-Weon Lee
Room: Pre-Function Area

5017: Low-Temperature H2S Sensing Enabled by Catalytically-Activated Au@SnO2 Core-Shell Nanospheres
Ying Li{1}, Xiangyang Wei{2}, Jingyuan Ma{1}, Rui You{2}
{1}Beijing Information Science and Technology University, China; {2}Laboratory of Intelligent Microsystems, Beijing Information Science and Technology University, China

5046: Boronic Acid-Based Impedimetric Glucose Sensor: A Multi-Layer Molecular Imprinting Technique
Koorosh Abbaspour, Somayeh Fardindoost, Mina Hoorfar
University of Victoria, Canada

5111: A Pressure Sensor Based on SOI Achieved Accurate Pressure Measurement Within the Range of 20 to 300℃ After Temperature Compensation
Yuanying Zhang, Binghe Ma, Fengyun Liu, Jinjun Deng, Xingxu Zhang, Jian Luo, Tao Zhang, Yunzhe Liu
Northwestern Polytechnical University, China

5234: Processing-Dependent Thermal Response of Nanostructured Platinum Thin Films Fabricated via Spark Ablation
Shatavisha Biswas, Mudassir Husain, Sten Vollebregt
Delft University of Technology, Netherlands

5281: Assembly-Free Electrode Manufacturing Process for Micro-Hemispherical Resonant Gyroscopes with Enhanced Capacitance
Yinan Zhang{2}, Mingwei Ma{2}, Bin Zhou{2}, Haoyu Gu{1}, Qi Wei{2}, Rong Zhang{2}
{1}Suzhou Raysen Microsystem Technology Co., Ltd, China; {2}Tsinghua University, China

5369: Additive Manufactured Capacitive Displacement Sensor for Pin Array Grippers: One-Shot and Stacked Fabrication Approaches
Steffen Schröder{2}, Thomas M. Wendt{3}, Stefan J. Rupitsch{1}
{1}Albert-Ludwigs-Universität Freiburg, Germany; {2}Offenburg University of Applied Sciences, Germany; {3}Work-Life Robotics Institute, Hochschule Offenburg / University of Applied Sciences Offenburg, Germany

5382: Flexible Piezoresistive Sensor Based on Laser-Induced Composite Graphene
Yimeng Jiang{1}, Misheng Liang{3}, Xiaomeng Bian{3}, Ruige Su{1}, Bo Wang{2}, Rui You{3}
{1}Beijing Information Science and Technology University, China; {2}Huazhong University of Science and Technology, China; {3}Laboratory of Intelligent Microsystems, Beijing Information Science and Technology University, China

5496: The Effects of MFC Material and Geometry on TMR Sensing Properties
Peter O'hanlon, Huxi Wang, Asfand Tanwear, Mahmoud Rasly, Siming Zuo, Kianoush Nazarpour, Hadi Heidari
Neuranics Limited, United Kingdom

5505: Maximizing TMR Sensor Resolution via Optimized Magnetic Flux Concentrators
Asfand Tanwear, Peter O'hanlon, Huxi Wang, Mahmoud Rasly, Siming Zuo, Kianoush Nazarpour, Hadi Heidari
Neuranics Limited, United Kingdom

5539: Compact LTCC-Integrated Fully Decoupled Biasing for Wireless Sensors
Ehsan Fallah Nia, Ammar Kouki
École de Technologie Supérieure ÉTS, Canada

5543: Effect of Electrode Printing Technology on Glucose Sensing Using ZnO Nanoparticles
Kimberly Mpala, Trudi-Heleen Joubert
University of Pretoria, South Africa

5572: Fabrication of Curved and Controlled-Slope Sidewall Profiles in Photoresist Using Low-Cost Grayscale Masks
Kimberly Rice, Khalil Najafi
University of Michigan, United States

5588: Development of a Cost Effective, Hybrid Microfabricated, All Glass Hermetic Package for Wireless In Vitro and Wearable Electrode Array Systems in Low Resource Settings
Faisal Bin Kashem{2}, Jorge Manrique Castro{3}, Omar Cepeda Torres{2}, Surbhi Tidke{2}, Cacie McDorman{1}, Gary Davies{1}, Swaminathan Rajaraman{2}
{1}Alleima, United States; {2}University of Central Florida, United States; {3}University of Texas at El Paso, United States

8:30-10:00
Posters: Sensors in Industrial Practices 2
Session Chairs: Paul Marsh, Vishali Rawat
Room: Pre-Function Area

5048: Visual Odometry Using Road Surface Motion Images from RGB-D Camera for Remote-Sensing to Inspect Outdoor Underground Infrastructure Facilities
Masato Mizukami, Ayuki Hirabayashi, Takuya Kosakai, Yoshikazu Ebina
Muroran Institute of Technology, Japan

5074: Edge Accelerated AI for Robotic Teleoperation
Alphonsus Keary{3}, Nehal Amer{1}, Masoud Emam{3}, Alan Dunne{2}, Javier Torres{3}, Kate O'Riordan{1}, Michael Walsh{3}, Brendan O'Flynn{3}
{1}Analog Devices, Ireland; {2}Emdalo Technologies, Ireland; {3}Tyndall National Institute, Ireland

5138: Synergistic Gas Sensing Mechanism in rGO–In2O3 Heterojunctions for Rapid and Selective Detection of Sub-ppm H2S
Tanya Sood, Poornesh P
Manipal Institute of Technology, MAHE Manipal, India

5187: Sensory Tool Holder for Thrust Measurement and Predictive Modeling of PCD Drill Life in Drilling
Jihng-Kuo Ho{2}, Po-Chun Wen{1}, Hao-Yang Lin{1}, Tsung-Yu Chang{2}, Her-Terng Yau{1}
{1}National Chung Cheng University, Taiwan; {2}National Taiwan Ocean University, Taiwan

5208: A Compact Two-Dimensional Misalignment Sensor Using Planar Coil and TMR Technology
Anil Kumar Appukuttan Nair Syamala A, Maier Jiri, Pavel Ripka
Czech Technical University in Prague, Czech Rep.

5444: Development of Smart Fiber Bragg Grating Based Surface Roughness Measurement System for Real Time Evaluation
Suraj Kumar{2}, Kapil Manoharan{2}, Shantanu Bhattacharya{2}, Ranamay Saha{2}, Umesh Tiwari{1}
{1}CSIR-Central Scientific Instruments Organization, India; {2}Indian Institute of Technology Kanpur, India

5452: Low-Power Impact Detection and Localization on Forklifts Using Wireless IMU Sensors
Lyssa Ramaut, Chesney Buyle, Jona Cappelle, Liesbet Van der Perre
Katholieke Universiteit Leuven, Belgium

5488: System Architecture of a Radar-Based Structural Health Monitoring System for Wind Turbine Blades Using Power Over Dataline
Tobias Huemmer{2}, Thomas Kurin{2}, Moritz Maelzer{3}, Katharina Fiedler{1}, Sebastian Beck{3}, Jochen Moll{3}, Fabian Lurz{2}
{1}Friedrich-Alexander University of Erlangen-Nuremberg, Germany; {2}Otto-von-Guericke-Universität Magdeburg, Germany; {3}Universität Siegen, Germany

5501: A Salinity-Compensation in Situ Microwave Phase Sensing for Water Film Thickness on Pavement
Guoxin Yang{2}, Chuanbiao Liu{2}, Yuan Chen{2}, Lei Han{2}, Qing-An Huang{1}
{1}Key Laboratory of MEMS of the Ministry of Education, Southeast University, China; {2}Southeast University, China

5542: Using 3D Hall Sensors to Measure Mechanical Stress for Planar Sensor's Sensitivity Compensation
Tobias Chlan{2}, Carl Riehm{2}, Markus Sand{1}, Philip Beran{1}, Ralf Brederlow{2}
{1}Fraunhofer Institute for Integrated Circuits IIS, Germany; {2}Technische Universität München, Austria; {2}Technische Universität München, Germany

13:00-14:30
Physical Sensors 4
Session Chair: Ino Kosuke
Room: Kitsilano A

13:00
5772: High-Sensitivity Magnetic Field Sensors Manufactured Utilizing CMOS-MEMS Technology (INVITED PRE-PUBLISHED JOURNAL PAPER)
Zhi-Xuan Dai{1}, Rong-Wei Tsai{2}, Qing-Hua Shih{1}
{1}National Chung Hsing University, Taiwan; {2}Taiwan Semiconductor Manufacturing Company, Taiwan

13:15
5773: Magnetoimpedance Sensor-Based in Vitro Real-Time Magnetic Recording System for Drug Screening Application (INVITED PRE-PUBLISHED JOURNAL PAPER)
Jiaju Ma, Norikazu Ohta, Takashi Ozaki, Shinya Moribe, Hirokazu Kikuta, Yusuke Hirata, Minoru Hirano
Toyota Central R&D Labs., Inc., Japan

13:30
5777: Bi-Axial Micro Force Plate Utilizing Dual Laser Displacement Meters for Ground Reaction Force Measurement in Fruit Flies (INVITED PRE-PUBLISHED JOURNAL PAPER)
Nozomi Ono{1}, Kenichiro Shimazaki{1}, Hirofumi Toda{2}, Takahashi Hidetoshi{1}
{1}Keio University, Japan; {2}University of Tsukuba, Japan

13:45
5789: Parametric Foam-Like Capacitive Sensors for 3-D Printing of Deformable Parts with Sensing Capabilities (INVITED PRE-PUBLISHED JOURNAL PAPER)
José Eduardo Aguilar Segovia{2}, Fabien Grzeskowiak{2}, Sylvain Lefebvre{1}, Marie Babel{2}, Sylvain Guégan{3}
{1}Université de Lorraine, CNRS, Inria, LORIA, France; {2}Université Rennes, INSA Rennes, Inria, CNRS, IRISA, France; {3}Université Rennes, INSA Rennes, LGCGM, France

14:00
5819: Separating Intrinsic and Extrinsic Responses of Whisker Sensors Using Accelerometer (INVITED PRE-PUBLISHED JOURNAL PAPER)
Prasanna Kumar Routray{1}, Debadutta Subudhi{1}, Basak Sakcak{2}, Steven M. Lavalle{2}, Pauline Pounds{3}, Manivannan Muniyandi{1}
{1}Indian Institute of Technology Madras, India; {2}University of Oulu, India; {3}University of Queensland, India

14:15
5836: Efficient and Robust Fabrication of Soft Sensors via Injection with Auxiliary Suction in Multi-Layered Microchannels with a Liquid Metal Alloy (INVITED PRE-PUBLISHED JOURNAL PAPER)
Hyungseok Yoon{1}, Seung-Won Kim{2}
{1}Korea Basic Science Institute, Korea; {2}Korea Institute of Science and Technology, Korea

13:00-14:30
Microwave Sensors
Session Chairs: Alex Mason, Olga Korostynska
Room: Kitsilano B

13:00
5822: Uncover Engineering Design & Modeling Challenges of Wearable Sensors Using Simulations (INVITED)
Laila Salman
ANSYS Canada Ltd. , Canada

13:30
5321: Non-Destructive Microwave Water Activity Meter for Dry-Cured Sausages
Alex Mason{3}, Stefania Gudrun Bjarnadottir{2}, Frøydis Bjerke{2}, Karl Helge Albretsen{1}, Per Berg{1}
{1}Nortura, Norway; {2}Norwegian Meat and Poultry Research Centre, Norway; {3}Norwegian University of Life Sciences, Norway

13:45
5372: High-Sensitivity Microwave Sensor for Continuous Monitoring of Water-Borne Suspended Solids
Mehri Ziaee Bideskan, Nima Karbaschi, Zahra Abbasi
University of Calgary, Canada

14:00
5303: A Microwave Sensor to Control the Purity of Products in Industrial Agrifood Processes
Paris Vélez, Pau Casacuberta, Ferran Martín
CIMITEC, Universitat Autònoma de Barcelona, Spain

13:00-14:30
Physical and Optical Sensors
Session Chair: Albert Romano Rodriguez
Room: Kitsilano B

13:00
5863: A PiezoMEMS Lissajous Frequency-Modulated Gyroscope: Stability, Vibration Robustness, and Challenges (INVITED PRE-PUBLISHED JOURNAL PAPER)
Antti Ontronen{1}, Ville Kaajakari{1}, Masahiro Ishii{2}, Chika Sakamoto{2}, Seiji Umezawa{2}, Yasuhiro Aida{2}
{1}Murata Electronics Oy, Finland; {2}Murata Manufacturing Co., Ltd., Japan

13:15
5875: Assessment of Ten Standardization-Based Calibration Transfer Techniques for Gas Sensors in a Small Data Context (INVITED PRE-PUBLISHED JOURNAL PAPER)
Balakumara Vignesh Muppidathi{3}, Bernard Bobby Ngoune{1}, Hamida Hallil{1}, Senthilmurugan Subbiah{2}, Berengere Lebental{4}
{1}CNRS, IMS, UMR 5218, Bordeaux INP, University of Bordeaux, France; {2}Indian Institute of Technology Guwahati, India; {3}Indian Institute of Technology Guwahati / Universite Gustave Eiffel, India; {4}Université Gustave Eiffel, France

13:30
5876: Reduced Graphene Oxide-Based Flexible Pressure Sensor for Biomedical Applications (INVITED PRE-PUBLISHED JOURNAL PAPER)
Alessandro Sanginario{2}, Irene Buraioli{2}, Marco Boscherini{2}, Stefania Vitale{4}, Sabrina Conoci{3}, Daniele Botto{2}, Dario Leone{1}, Alberto Milan{1}, Artur Ciesielski{4}, Paolo Samorì{4}, Danilo Demarchi{2}
{1}Candiolo Cancer Institute FPO-IRCCS, Italy; {2}Politecnico di Torino, Italy; {3}Università degli Studi di Messina, Italy; {4}Université de Strasbourg & CNRS, France

13:45
5890: Distribution of the Clamped Boundary and its Impact on Resonator Performance
Haleh Nazemi, Yumna Birjis, Pavithra Munirathinam, Mohd Farhan Arshi, Arezoo Emadi
University of Windsor, Canada

14:00
5900: Fully Automated Microfluidic Electrochemical Platform As a Versatile Biosensor
Niranjan Haridas Menon, Yassa Behsai, Sagnik Basuray
New Jersey Institute of Technology, United States

13:00-14:30
Sensor Processing & AI
Session Chair: Santiago Marco
Room: Kitsilano D

13:00
5736: Sensor Fault Recognition with Multi-Output Regression Network
Phil Meier, Marcus Prochaska
Ostfalia Hochschule für angewandte Wissenschaften, Germany

13:15
5756: Analytical Accuracy Prediction Model for Fourier Transform-Based Coating Thickness Estimation in Eddy Current Testing of Coated Steel Sheets Using a Multi-Frequency Approach
Martin Koll{1}, Daniel Wöckinger{1}, Gerd Bramerdorfer{1}, Stefan Schuster{2}, Stefan Scheiblhofer{2}, Norbert Gstöttenbauer{2}, Johann Reisinger{2}
{1}Johannes Kepler University Linz, Austria; {2}voestalpine Stahl GmbH, Austria

13:30
5766: Cross-Sensor Transferability of a Deep Residual U-Net for Sleep Staging Using Temporal Low-Frequency Photoplethysmography
Neil Joshua Limbaga, Haozheng He, José Ilton de Oliveira Filho, Khaled Nabil Salama
King Abdullah University of Science and Technology, Saudi Arabia

13:45
5771: PPG-Based Biometric Token for Key Generation to Secure Medical Data in IoT-Driven Healthcare
Ichrak Eddor Mnijli{2}, Amal Sammoud{1}, Guillaume Terrasson{4}, Nicolas Huloux{1}, Mariem Feki{3}
{1}Afflokat,Mira Mediterranean Institute of Robotics and Automation, France; {2}Afflokat,Mira Mediterranean Institute of Robotics and Automation, Estia, ISI, France; {3}ISI, University of Tunis El Manar, Tunisia; {4}Université de Bordeaux, ESTIA-Institute of Technology, France

14:00
5780: Artificial Intelligence (AI)-Assisted Measurement of Glucose, Sodium, and Potassium Concentrations in Diluted Aqueous Solutions Using Microwaves
Pau Casacuberta{1}, Paris Vélez{1}, Ferran Paredes{2}, Ferran Martín{1}
{1}CIMITEC, Universitat Autònoma de Barcelona, Spain; {2}Universitat Autònoma de Barcelona, Spain

14:15
5801: A Closed-Form Algorithm for Integrated TOF-PDR Positioning Using a Single Anchor
Tomoya Haga{1}, Naoki Honma{1}, Kentaro Murata{1}, Atsushi Miura{2}, Tsubasa Yanagawa{2}
{1}Iwate University, Japan; {2}Musen Connect, Inc., Japan

13:00-14:30
Energy & Actuators
Session Chair: Mantalena Sarafianou
Room: Fairview I & II

13:00
5752: Sensitivity of Resonant Moving Magnet Actuators to Haptic Environments
Sebastian Lang{2}, Nikolaus Doppelhammer{1}, Alexander Niedermayer{2}, Tina Mitteramskogler{2}, Bernhard Jakoby{2}
{1}Centre of Surface Chemistry and Catalysis Characterization, Katholieke Universiteit Leuven, Belgium; {2}Institute for Microelectronics and Microsensors, Johannes Kepler University Linz, Austria

13:15
5758: Porous Silk Scaffold-Integrated TENG for Sustainable Energy Harvesting
Aditya Bhagavathi K{2}, Trinadha Rao Karri{2}, Satish Bonam{2}, Jose Joseph{1}, Atul Kumar Gupta{2}, Shiv Govind Singh{2}, Siva Rama Krishna Vanjari{2}
{1}Digital University Kerala, India; {2}Indian Institute of Technology Hyderabad, India

13:30
5763: Acoustic Energy Transfer for Integrated Sensor Systems
Mark Suppelt{2}, Felix Herbst{2}, Stephan Schaumann{2}, David Riehl{2}, Dirk Leiacker{2}, Julian Peters{1}, Sonja Wismath{2}, Sven Suppelt{2}, Klaus Hofmann{2}, Sven Matthiesen{1}, Mario Kupnik{2}
{1}Karlsruhe Institute of Technology, Germany; {2}Technische Universität Darmstadt, Germany

13:45
5774: A Robust Energy Management Circuit for Energy Harvesting from Wideband Low-Acceleration Vibrations in Wireless Sensor Screws
Kholoud Hamza
Technische Universität Chemnitz, Germany

14:00
5877: Wireless Battery-Free Self-Powered Water Leak Detection Through Hydroelectric Energy Harvesting (INVITED PRE-PUBLISHED JOURNAL PAPER)
Mohammadreza Rouhi, Roshan Nepal, Simran Chathanat, Nimesh Kotak, Nathan Johnston, Ahmad Ansariyan, Kamalpreet Kaur, Kushant Patel, Norman Zhou, George Shaker
University of Waterloo, Canada

13:00-14:30
Chemical, Electrochemical & Gas Sensors 3
Session Chairs: Hamida Hallil, Santiago Marco Colas
Room: Fairview III & IV

13:00
5014: Amorphous Nb2O5 and Ta2O5 on ISFETs: An Initial Comparison for High Temperature pH Sensing
Christopher Beale, Götz Ringmann, Hans-Georg Dallmann, Laurence Kühne, Matthias Wambold, Falah Al-Falahi, Vladimir Kolkovsky, Eberhard Kurth, Olaf Rüdiger Hild
Fraunhofer Institute for Photonic Microsystems IPMS, Germany

13:15
5239: Development of a Low-Cost Miniaturized Potentiostat for Dopamine Detection
Pritu Parna Sarkar, Alexa Barrera, Katherine Enriquez, Adrian Camacho, Ahmed Jalal, Nazmul Islam
University of Texas Rio Grande Valley, United States

13:30
5126: Minimizing Interference in Zirconia-Based Electrochemical Gas Sensor for VOC Detection
Sri Ayu Anggraini, Yuki Fujio, Hiroshi Yamada, Mutsunori Uenuma, Takashi Fukuda
National Institute of Advanced Industrial Science and Technology, Japan

13:45
5240: Evaluation of CMOS Polysilicon Resistors for Thermal Conductivity-Based Gas Sensing
Gianluca Boni{1}, Aurelio Venditti{1}, Nishit Goel{2}, Ilya Gurin{2}, Stephen Bart{2}, Ben Davaji{1}, Matteo Rinaldi{1}, David Horsley{1}
{1}Northeastern University, United States; {2}TUC, TDK-InvenSense, United States

14:00
5395: Ionic-Liquid-Functionalized Graphene Devices for Trace Detection of Gas Molecules
Kazuki Kikawada, Kenzo Maehashi
Tokyo University of Agriculture and Technology, Japan

13:00-14:30
Modeling and Simulations
Session Chair: Nouah AlCheikh
Room: Fairview V

13:00
5838: Implementation and Validation of a Comprehensive, Noise-Aware FMCW Radar Simulation Framework (INVITED PRE-PUBLISHED JOURNAL PAPER)
Barnaba Ubezio
Universität Klagenfurt or Alpen-Adria-Universität Klagenfurt, Austria

13:15
5852: The Digital-Twin Modeling Method and Cross-Coupling Mechanism of Quartz Flexible Accelerometer (INVITED PRE-PUBLISHED JOURNAL PAPER)
Wanying Huang{1}, Chunxi Zhang{1}, Lailiang Song{1}, Wei Zhang{2}, Zhifang Zhu{1}, Longjun Ran{1}
{1}Beihang University, China; {2}Hunan Shuaiwei Control Technology Co. Ltd., China

13:30
5872: PixTransNet: a Sensor-Aware CNN-Transformer Model for Magnetic Flux Leakage Defect Segmentation
Zahra Arabi Narei{2}, Henry Leung{2}, Scott Miller{1}, Jyoti Phirani{1}
{1}Baker Hughes Company, Canada; {1}Baker Hughes Company, United Kingdom; {2}University of Calgary, Canada

13:45
5873: Quantifying Digitizer Design Requirements for a Sediment-Generated Noise Instrument
Quinn Morgan{1}, Nate Sjullie{1}, James White{2}, David Burnett{1}
{1}Portland State University, United States; {2}United State Geological Survey, United States

14:00
5915: A Hybrid Analytical and Machine Learning Model of BioFETs for the Detection of Peptides
Nicholas Smoliak{2}, Naveen Kumar{1}, Pedro Miguel Parreira{2}, Craig Macdonald{2}, Vihar Georgiev{1}
{1}DeepNano Research Group, University of Glasgow, United Kingdom; {2}University of Glasgow, United Kingdom

13:00-14:30
Compensation & Integration of Sensor Systems
Session Chairs: Hengky Chandrahalim, Masaki Iizuka
Room: Granville

13:00
5529: Void Fraction Measurement in Multiphase Flows: Sensor Calibration and Performance
Daniely Neves{1}, Victor Gomes{2}, Natan Bulgarelli{1}, Rodolfo Perissinotto{1}, William Monte Verde{1}, Marcelo Castro{2}
{1}Center for Energy and Petroleum Studies, University of Campinas, Brazil; {2}Universidade Estadual de Campinas, Brazil

13:15
5666: A Combined Dynamic Mode Decomposition-Constant False Alarm Rate Algorithm for Near-Real-Time Moving Target Detection
Andrej Vukovic{1}, Thomas Forsdyke{1}, Shashank Pant{3}, Pascale Sevigny{2}, Bhashyam Balaji{2}, Sreeraman Rajan{1}
{1}Carleton University, Canada; {2}DRDC Ottawa Research Centre, Canada; {3}National Research Council, Canada

13:30
5715: A Compensation Method of Capacitive Angle Sensors in Ultrasonic Motors During Start and Stop Stages
Zhongrui Ma{1}, Xin Zhao{1}, Zhaoli Wei{1}, Ting Li{1}, Longqi Ran{1}, Jiangbo He{2}, Wu Zhou{1}
{1}University of Electronic Science and Technology of China, China; {2}Xihua University, China

13:45
5525: Laser-Based Raindrop Sensing for Wind Error Correction in Rainfall Measurements
Mark Dutton{2}, Bailey Hurst{2}, Phillip Harley{1}, Domenico Balsamo{2}
{1}Harley Scientific Instruments, United Kingdom; {2}Newcastle University, United Kingdom

14:00
5427: Optimized Target Detection for Point Cloud Generation with Radar-LiDAR Fusion
Tae-Young Chun, Jeong-Hoon Park, Seong-Cheol Kim
Seoul National University, Korea

14:15
5361: Controlling and Monitoring a Magnetic Atom Trap with Consumer-Grade Electronics
Lars Martin, Andrea Capra, Jack Ewins, Makoto Fujiwara, Fionn Milhench, Chukman So, Giles Wankling
TRIUMF, Canada

13:00-14:30
Chemical and Physical Sensors
Session Chair: Silvan Schmid
Room: Cambie

13:00
5855: Multi-Gas Differentiation with Individual Electrochemical Gas Sensors
Radislav Potyrailo
GE Vernova Advanced Research Center, United States

13:15
5862: Constant-Flow Liquid Transfer System for Skin Microperfusion Biosensing Using a Passive Flow Regulator and a Vacuum Chamber
Koyo Kayaba, Yoichi Haga, Noriko Tsuruoka
Tohoku University, Japan

13:30
5865: Active heat-Loss Compensated Miniaturized Pirani Sensor Chip
Julian Eiler{1}, Stefan Weber{2}, Peter Gerlesberger{2}, Heinz Plöchinger{2}, Rupert Schreiner{1}
{1}Ostbayerische Technische Hochschule Regensburg, Germany; {2}Thyracont Vacuum Instruments GmbH, Germany

13:45
5880: A Method for Expanding the Bandwidth and Decreasing the Actuation Voltage of CMUT Devices
Chirag Goel{1}, Mathieu Gratuze{2}, Alexandre Robichaud{3}, Ricardo Izquierdo{2}, Paul-Vahé Cicek{4}
{1}Ecole de technologie supérieure, Canada; {2}École de Technologie Supérieure ÉTS, Canada; {3}Université du Québec à Chicoutimi, Canada; {4}Université du Québec à Montréal, Canada

14:00
5883: Dual-Mode Detection of Urinary Chemokine and Ion Imbalance of BPS/IC Patients Towards Therapeutic Efficacy Assessment
Tanzila Noushin{1}, Jinwon Jeong{1}, Muhammad Luqman Haider{2}, Yun Ting Hsia{1}, Jeong Bong Lee{1}
{1}Baylor University, United States; {2}University of Texas at Dallas, United States

14:15
5887: A Multimatrix E-Nose with Optimal Multiranged AFE Circuit for Human Volatilome Fingerprinting (INVITED PRE-PUBLISHED JOURNAL PAPER)
Antonio Vincenzo Radogna{2}, Giuseppe Grassi{2}, Stefano D'Amico{2}, Pietro Aleardo Siciliano{1}, Angiola Forleo{1}, Simonetta Capone{1}
{1}CNR-IMM, Italy; {2}Università del Salento, Italy

14:30-16:00
Posters: Chemical, Electrochemical & Gas Sensors 6
Session Chairs: Bérengère Lebental, Santiago Marco Colas
Room: Pre-Function Area

5432: Photoinduced Nitrate Sensing with TiO_2 Nanorods: Toward Efficient Nutrient Monitoring in Water and Soil
Farbod Aleaziz, Fariborz Taghipour
University of British Columbia, Canada

5443: Highly Sensitive, Drift-Minimized, Flexible SWCNT/PEI-DAN Based CO Sensor
Pavlos Tzourmpakis, Adarsh Sivan Pillai, Sakandar Rauf, Mohammad Vaseem, Igor Getmanov, Atif Shamim
King Abdullah University of Science and Technology, Saudi Arabia

5507: Gate-Bias Modulation for Selective Odor Sensing in Polymer-Based TFT Sensor Array
Minji Yu{1}, Wonhyuk Choi{2}, Heechang Park{3}, Jeonghun Lee{1}, Goeun Pyo{1}, Jeonggyun Jang{1}, Hyeokjin Kwon{1}, Hyeongtae Lim{1}, Hyukjun Kwon{1}, Jaeeun Jang{1}
{1}Daegu Gyeongbuk Institute of Science and Technology, Korea; {2}Daegu Gyeongbuk Institute of Science and Technology, Dongjin Semichem Company Ltd, Korea; {3}Daegu Gyeongbuk Institute of Science and Technology, SK hynix Inc., Korea

5526: Cuprous Oxide Functionalized Transition Metal Diselenide for Gas Sensing Applications
Mubdiul Islam Rizu, Mohamed Elsheshtawy, Fatima Ezahra Annanouch, Dalal Fadil, Eduard Llobet
Universitat Rovira i Virgili, Spain

5533: Crumpled and Exfoliated Graphene as Transducers in High Sensitivity Potentiometric Nitrate Sensors
Henry Wysong-Grass{3}, Kaun-Yu Chen{3}, Sharar Muhtasim{3}, Aydan Akyildiz Mert{2}, Claudia López-Cámara{1}, Hartmut Wiggers{2}, Joseph Andrews{3}
{1}Eindhoven University of Technology, Netherlands; {2}Universität Duisburg-Essen, Germany; {3}University of Wisconsin-Madison, United States

5557: Label-Free Electrochemical Detection of Transthyretin for Patients with Cardiac Amyloidosis
Seerat Sekhon{2}, Gugleilmo Verona{2}, Richard Bayford{1}, Andreas Demosthenous{2}
{1}Middlesex University, United Kingdom; {2}University College London, United Kingdom

5558: Electronic Nose for Quality Control in Tomato Processing
Carlos Sánchez-Vicente{2}, José Pedro Santos{2}, Isabel Sayago{2}, Jesús Lozano{3}, Ramiro Sánchez{1}, José Ignacio Suárez{3}
{1}Center for Scientific and Technological Research of Extremadura, Spain; {2}Spanish National Research Council, Spain; {3}Universidad de Extremadura, Spain

5630: Screen-Printed Structured Silicon-Graphene Electrodes for High Capacity and Cycling Lithium-Ion Batteries
Himanaga Rama Krishn Emani{2}, Dinesh Maddipatla{2}, Anthony Hanson{2}, Binu Narakathu{1}, Massood Atashbar{2}
{1}SafeSense Technologies LLC, United States; {2}Western Michigan University, United States

14:30-16:00
Posters: Physical Sensors 7
Session Chair: Siming Zuo
Room: Pre-Function Area

5514: A True Zero-Power, Omnidirectional MEMS Acceleration Logger with Digital Output
Inês Sofia Garcia{2}, Filipa Mota{2}, Fahimullah Khan{3}, Carlos Ferreira{1}, Jorge Cabral{1}, Rosana Dias{2}, Filipe Alves{2}
{1}CEiiA, Portugal; {2}INL - International Iberian Nanotechnology Laboratory, Portugal; {3}International Iberian Nanotechnology Laboratory, Portugal

5596: Two Tone Excitation for Fundamental Mode Orthogonal Fluxgate Gradiometer
Michal Dressler, Mattia Butta Gonzales, Michal Janošek
Czech Technical University in Prague, Czech Rep.

5603: Passive Gas Sensing of Hydrogen-Oxygen Mixtures by Intrinsic Noise Spectrum Analysis of a MEMS Microphone
Emanuel Wallesch{2}, Gabriel Rodriguez Gutierrez{2}, Álvaro Ortiz-Pérez{2}, Stefan Palzer{1}
{1}Professorship for Sensors, Technische Universität Dortmund, Germany; {2}Technische Universität Dortmund, Germany

5699: A Dual-Mode Azo-Based Surface Acoustic Wave Temperature Sensor in Single-Phase Unidirectional Transducer Configuration
Rafael M. Pangilinan, Salvacion B. Orgen, Rozen Grace B. Madera, Magdaleno R. Vasquez Jr., Maria Theresa G. De Leon
University of the Philippines Diliman, Philippines

5702: Shear and Out-of-Plane Stress Analysis in Silicon Chip-in-Foil Assemblies
Vartika Verma, Carl Riehm, Tobias Chlan, Szabolcs Molnar, Ralf Brederlow
Technische Universität München, Germany

5703: Improving Inductive Sensing of Superparamagnetic Nanoparticles Through Orientation of Easy Axes
Margo Hauwaert{4}, Nordin Trifiro{4}, Vanessa Pilati{3}, Louise Lejeune{4}, Simo Spassov{2}, Martin Lefebvre{1}, Ramy Moumneh{4}, Sophie Hermans{4}, Montserrat Rivas{3}, Jean-Pierre Raskin{4}
{1}Delft University of Technology, Netherlands; {2}Royal Meteorological Institute of Belgium KMI-IRM, Belgium; {3}Universidad de Oviedo, Spain; {4}Université catholique de Louvain, Belgium

5712: Self-Compensation Technology for Temperature Drift in Resonant Accelerometers
Ting Li{1}, Zhongrui Ma{1}, Zhaoli Wei{1}, Longqi Ran{1}, Jiangbo He{2}, Wu Zhou{1}
{1}University of Electronic Science and Technology of China, China; {2}Xihua University, China

5723: Thermal Characteristics of an Electric Field Mill in the Nonlinear Duffing Regime
Lifang Ran{2}, Hongyun Ren{2}, Najib Kacem{1}, Jianhua Li{2}, Xiaolong Wen{2}
{1}Université Marie et Louis Pasteur, France; {2}University of Science and Technology Beijing, China

14:30-16:00
Posters: Optical Sensors 4
Session Chair: Michiko Nishiyama
Room: Pre-Function Area

5288: Light-Based Food Assurance: Non-Destructive Carob Molasses Authentication via Pocket-Sized Near-Infrared Spectroscopy and Chemometrics
Fatima Dokmak{2}, Anna Grazia Mignani{1}, Andrea Azelio Mencaglia{1}, Leonardo Ciaccheri{1}
{1}CNR-Istituto di Fisica Applicata “Nello Carrara”, Italy; {2}Lebanese University, Lebanon

5336: AlGaAsSb APD for 1550 nm LiDAR Maintaining Sufficient SNR in High-Gain Operation
Mitsuharu Hirano, Takeshi Okada, Munetaka Kurokawa, Masaki Sato, Ryo Sugahara, Kazutoshi Natsume
Sumitomo Electric Industries, Ltd., Japan

5363: Novel Clinical Near-Infrared Spectroscopy Sensor in Flap Monitoring
Amir Parham Pirhadi Rad, Oleksandr Butskiy, Iman Amani Tehrani, Sina Maloufi, Donald W. Anderson, Babak Shadgan
University of British Columbia, Canada

5391: Development of an In-Situ, Microspectrometer- Based Sensor for Monitoring Carbon Fiber Curing
Yu-Chen Hsu{3}, Sung-Wei Huang{1}, Chitsung Hong{4}, Cheng-Hao Ko{1}, Hung-Wei Huang{1}, Wei-Leun Fang{2}
{1}National Taiwan University of Science and Technology, Taiwan; {2}National Thing Hua University, Taiwan; {3}National Tsing Hua University, Taiwan; {4}Spectrochip.Inc, Taiwan

5473: Resonance Light Scattering Based Detection of Fluoride in Water
Sagar Rana{1}, Sudeshna Bagchi{2}
{1}AcSIR, CSIR-Central Scientific Instruments Organization, India; {2}CSIR-Central Scientific Instruments Organization, India

5483: Plasmon-Enhanced Dual-Mode UV Photodetector Using Au-Decorated MoS_2/p-GaN Heterojunction for Self-Powered and High-Gain Operation
Nur Adnin Akmar Zulkifli{1}, Rozalina Zakaria{3}, Nur Aina'A Mardhiah Zainuddin{2}
{1}King Fahd University of Petroleum and Minerals, Saudi Arabia; {2}Universiti Malaya, Malaysia; {3}University of Malaya, Malaysia

5594: In-Situ Monitoring of Diamond Film Growth with Double-Layer Optical Fiber Interferometer
Marcin Koba{3}, Agnieszka Martychowiec{1}, Norbert Kwietniewski{1}, Štepán Potocký{2}, Alexander Kromka{2}, Mateusz Śmietana{1}
{1}Institute of Microelectronics and Optoelectronics, Warsaw University of Technology, Poland; {2}Institute of Physics, Czech Academy of Sciences, Czech Rep.; {3}National Institute of Telecommunications, Poland

5155: Miniaturized Pressure Probe for Distributed Sensing Based on 3D Structured Optical Fiber and Capillaries
Marvin Friedemann, Sebastian Voigt, Axel Müller, Jan Mehner
Chemnitz University of Technology, Germany

5268: Novel Flexible Packaging Enables Highly Sensitive, Self-Decoupled FBG Strain Sensing in Extreme Environments
Yilin Fan, Shengming Ma, Tao Zhang, Yu Lei, Ying Chang, Binghe Ma
Northwestern Polytechnical University, China

5753: HMR-Based Optical Gas Detection with CuO & ZnO Coatings
Elieser Ernesto Gallego Martínez{1}, Carlos Ruiz Zamarreño{2}, Ignacio Raúl Matías Maestro{2}
{1}Public University of Navarra, Spain; {2}Universidad Pública de Navarra, Spain

5755: Lossy Mode Resonance and Hyperbolic Mode Resonance – Based Optical Sensors by Means of Y3Fe5O12 and SrTiO3 Films Deposition on Planar Substrates
Angel Correa Fernández{1}, Elieser Ernesto Gallego Martínez{1}, Carlos Ruiz Zamarreño{2}, Ignacio Raúl Matías Maestro{2}
{1}Public University of Navarra, Spain; {2}Universidad Pública de Navarra, Spain

14:30-16:00
Posters: Advances in Sensor Phenomenology, Modeling, & Applications 3
Session Chairs: Charusluk Viphavakit, Arum Han
Room: Pre-Function Area

5041: A Mechatronic Eye Movement Emulator for Benchmarking AR/VR Eye-Tracking Sensors
Zehao Huang{3}, Xiaoting Duan{3}, Gancheng Zhu{3}, Rong Wang{2}, Shuai Zhang{1}, Zhiguo Wang{3}
{1}Tianmushan Laboratory, China; {2}Zhejiang Sci-Tech University, China; {3}Zhejiang University, China

5233: Topology-Driven Field Distribution for Enhanced Performance in OFET Sensors
Mohd Farhan Arshi, Tiago Carneiro Gomes, Haleh Nazemi, Aya Abu-Libdeh, Matthew Zojac-Rivest, Abhijith C. Bijukumar, Simon Rondeau-Gagné, Arezoo Emadi
University of Windsor, Canada

5259: Determination of Pore Diameter in Polyurethane/PEDOT:PSS Porous Electrodes Using Electrochemical Impedance Spectroscopy
Diogo Correia, Paulo R.F. Rocha
Universidade de Coimbra, Portugal

5340: Uncertainties of a Spherical Magnetic Field Camera
Fynn Foerger, Philip Suskin, Marija Boberg, Jonas Faltinath, Tobias Knopp, Martin Möddel
Universitätsklinikum Hamburg-Eppendorf, UKE / Technische Universität Hamburg, Germany

5675: Modeling of Evanescent Fiber Sensors for CO2-H2O Detection in the Mid-Infrared Wavelength
Fatemeh Abrishamian{3}, Ai Hosoki{1}, Airi Suka{3}, Akira Ueda{3}, Hideki Kuramitz{3}, Amane Terai{2}
{1}Akita University, Japan; {2}Japan Organization for Metals and Energy Security, Japan; {3}University of Toyama, Japan

5686: Design of Parallel-Plate Capacitive Angle Sensor for Bi-Axial Scanning Micromirror
Biqing Zhou, Biyun Ling, Xiaoyue Wang, Yaming Wu
Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China

5614: Inertial Measurement Unit Size Effect Calibration for Arbitrarily Rotated Accelerometer Triad
Roman Gataullin, Alexander Kozlov, Fedor Kapralov
Navigation and Control Lab, Lomonosov Moscow State University, Russia

5901: Fundamental DATS Sensor Numerical Model for High and Low Frequency Stimuli
Guilherme Heim Weber
Universidade Tecnológica Federal do Paraná, Brazil

14:30-16:00
Live Demos
Session Chairs: Youngwook Kim, Tina Shoa, Anna Mignani, Hossein Cheraghi Bidsorkhi
Room: Pre-Function Area

5212: Live Demonstration: iGii Sensors for Real-Time Finger Tracking
Isidoro Ruiz-García{2}, Michael McKinlay{2}, Michelle Ntola{1}, Marco Caffio{1}, Carlos García Núñez{2}
{1}iGii Ltd, United Kingdom; {2}University of Glasgow, United Kingdom

5351: No Measuring Tape, No Wires, No Worries - Scalable Ultrasound Arrays with Built-In RF Sync and Optical Localization
Dennis Laurijssen, Rens Baeyens, Walter Daems, Jan Steckel
Cosys-Lab, University of Antwerp, Belgium

5394: Live Demonstration: Experience of Hammering Test
Atsushi Ito{1}, Yuto Kurosawa{1}, Masako Saito{4}, Katsuhiko Hibino{2}, Nishchal Acharya{3}, Masafumi Koike{4}
{1}Chuo University, Japan; {2}PORT DENSHI Corporation, Japan; {3}Tribhuvan University, Nepal; {4}Utsunomiya University, Japan

5513: Detection Characteristics of Smoke and Flames Using Si-RGB Color Sensors
Bo Hee Lee, Jiwon Choi, Haiyoung Jung
Semyung University, Korea

5550: Live Demonstration: Intelligent, 3D-Printed Respiratory Add-On for FFP3 Masks: Enhancing HSE Through Open and Scalable Design
Mariangela Pinnelli{6}, Fabrizio Marra{8}, Massaroni Carlo{7}, Giulia Di Salvo{5}, Mariangela Filosa{4}, Calogero Maria Oddo{4}, Alessandro Ledda{1}, Emiliano Schena{7}, Alessio Tamburrano{3}, Maria Sabrina Sarto{2}
{1}INAIL, Italy; {2}Sapienza – Università di Roma, Italy; {3}Sapienza University of Rome, Italy; {4}Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna, Italy; {5}Scuola Superiore Sant'Anna, Italy; {6}Università Campus Bio-Medico di Roma, Italy; {7}Università Campus Bio-Medico di Roma / Fondazione Policlinico Universitario, Italy; {8}Università di Roma La Sapienza, Italy

5561: A TMR-Enabled Wristband for Gesture Recognition
Eisa Aghchehli, Chenfei Ma, Maja Schmidt, Huxi Wang, Siming Zuo, Hadi Heidari, Kianoush Nazarpour
Neuranics Limited, United Kingdom

5591: Live Demonstration: Printed Graphene-Based Smart Insole for Real-Time Pedobarometry and Gait Analysis
Hossein Cheraghi Bidsorkhi, Alessandro Giuseppe D'aloia, Maria Sabrina Sarto
Sapienza – Università di Roma, Italy

5687: Live Demonstration: A vAFE-Based Wearable for Real-Time ECG Monitoring and Analysis
Federica Durini{1}, Lars Ingmar Stumpp{1}, Giuseppe Spingola{3}, Matteo Mercati{3}, Valentine Beux{3}, Enrico Alessi{2}, Cristina Bagini{3}, Calogero Maria Oddo{1}, Mariangela Filosa{1}
{1}Scuola Superiore di Studi Universitari e di Perfezionamento Sant'Anna, Italy; {2}STMicroelectronics, Italy; {3}TD Group Italia Srl, Italy

5692: Live Demonstration: Intelligent Mailbox System Integrating Image Recognition and Large Language Models
Huan-I Liao, Jen-Chieh Wu, Yi-Ting Wang, Kun-Lin Liu, Shahsank Mishra, Jia-Ming Liang, Jen-Jee Chen
National University of Tainan, Taiwan

5704: Graph-Based Strategies for Optimizing Mobile Sensor Distribution in Decentralized Urban Pollution Monitoring Across Dynamic Global Cities
Daniel Mutembesa, Engineer Bainomugisha
Makerere University, South Africa

14:30-16:00
Posters: Sensors, Actuators, & Energy
Session Chairs: Pai-Yen Chen, Darrin Young
Room: Pre-Function Area

5196: Flip-Chip Bonded Dual-Substrate RF MEMS Switch with SOI Cantilever
Liwei Jiang, Zirui Liu, Zheyao Wang
Tsinghua University, China

5292: Acoustic Steering via Multiaxial Driving: A Study on the Effect of Element Geometry
Armin Rahmaninejad, Samuel Pichardo, Laura Curiel
University of Calgary, Canada

5323: RF-Powered Batteryless Plant Movement Sensor for Precision Agriculture
Jona Cappelle, Jarne Van Mulders, Sarah Goossens, Thomas Reher, Liesbet Van der Perre, Lieven De Strycker, Bram Van de Poel, Gilles Callebaut
Katholieke Universiteit Leuven, Belgium

5348: Effect of DC Bias on Optimizing $Sc_{0.3}Al_{0.7}N$ Cantilever-Type MEMS Speaker to Improve Acoustic Performance
Prakasha Chigahalli Ramegowda{1}, David Sze Wai Choong{1}, Shyam Trivedi{1}, Thien Yu Feng{1}, Sagnik Ghosh{1}, Liu Jihang{1}, Teo Yong Shun{1}, Hong Yan{1}, Sarafianou Mantalena{1}, Fabrizio Cerini{2}, Alberto Leotti{2}, M. G. Koppisetti{2}, A. Das{2}, C. Lazzari{2}, Yul Koh{1}
{1}IME, Agency for Science, Technology and Research, Singapore; {2}STMicroelectronics, Italy; {2}STMicroelectronics, Singapore

5720: Self-Powered Wearable Drone Control System Based on Triboelectric Nanogenerators
Shingirirai Chakoma, Rahim Esfandyarpour
University of California, Irvine, United States

14:30-16:00
Posters: Systems and Data Processing
Session Chair: Samantha Grist
Room: Pre-Function Area

5882: Parameter Optimization Framework for Enhancing Radar-Based Material Recognition (INVITED PRE-PUBLISHED JOURNAL PAPER)
Sejung Kim, Jaeho Kim
Sejong University, Korea

5884: Geomagnetic Guided Underwater Navigation with Gradient Multi-Attention Neural Networks (INVITED PRE-PUBLISHED JOURNAL PAPER)
Qianyun Zhang{1}, Songnan Yang{2}, Xiaohui Zhang{2}, Ding Liu{2}, Wenqi Bai{2}, Fan Liu{2}
{1}University of Toronto, Canada; {2}Xian University of Technology, China

5891: Bimodal Profile Diagrams for Breast Cancer Classification Using Convolution Neural Network (INVITED PRE-PUBLISHED JOURNAL PAPER)
Nazia Rahman, Vira Oleksyuk, Chang-Hee Won
Temple University, United States

5893: Adaptive Coverage Optimization for Energy-Constrained Multicamera Surveillance Networks (INVITED PRE-PUBLISHED JOURNAL PAPER)
Sumi Suresh M. S.{2}, Vivek Menon{1}, Venu Govindaraju{2}
{1}Amrita Vishwa Vidyapeetham, India; {2}State University of New York at Buffalo, United States

5895: Fast Data-Driven Greedy Sensor Selection for Ridge Regression (INVITED PRE-PUBLISHED JOURNAL PAPER)
Yasuo Sasaki{1}, Keigo Yamada{2}, Takayuki Nagata{1}, Yuji Saito{2}, Taku Nonomura{1}
{1}Nagoya University, Japan; {2}Tohoku University, Japan

5899: Classification and Characterization of LoRaWAN Energy Depletion Attacks: a Review (INVITED PRE-PUBLISHED JOURNAL PAPER)
André Proto{2}, Charles Miers{1}, Tereza Carvalho{2}
{1}Santa Catarina State University, Brazil; {2}USP, Brazil

5851: Malalignment Detection in TKA: a Digital Twin Framework Using Instrumented Tibial Trays
Leila Merzak{2}, Célestin Ott{1}, Elise Saoutieff{1}, Pierre Gasnier{1}, Vincent Elhorga{1}, Sébastien Boisseau{1}
{1}CEA-Leti, France; {2}Université Grenoble Alpes, CEA-Leti, France

5898: Methods for Beamforming Using Structural Sensors on an Elastic Panel
Jenna Rutowski{2}, Tre Dipassio{1}, Benjamin Thompson{2}, Mark Bocko{2}, Michael Heilemann{2}
{1}Harman International, United States; {2}University of Rochester, United States

5902: Removing Snowfall Noise from Point Clouds Without Considering the Nearest Neighbors (INVITED PRE-PUBLISHED JOURNAL PAPER)
Kensho Nakajima, Yuto Inaoka, Kazushi Fujimoto, Nobuhiko Nishio
Ritsumeikan University, Japan

5904: Sustainable Occupancy Sensing Platform via Triboelectric and Piezoresistive Pressure Sensors
Isidoro Ruiz-García{2}, Emma Keel{3}, Ashwini Konanahalli{3}, Des Gibson{3}, Morteza Amjadi Kolou{2}, Marco Caffio{1}, Hadi Heidari{2}, Carlos García Núñez{2}
{1}iGii Ltd, United Kingdom; {2}University of Glasgow, United Kingdom; {3}University of the West of Scotland, United Kingdom

5905: FCGNet: a Deep Learning Methodology for Real-Time Prediction of Fatigue Crack Growth Rate Using Acoustic Emission Signals (INVITED PRE-PUBLISHED JOURNAL PAPER)
Deepak Joshi{1}, Sunil. K Pandu{1}, Kamal Mankari{1}, Prasannata Bhange{1}, Sridhar Kasthurirangan{2}, Swati Ghosh Acharyya{3}, Amit Acharyya{1}
{1}Indian Institute of Technology Hyderabad, India; {2}Naval Materials Research Laboratory, India; {3}University of Hyderabad, India

5906: Driving in the Extreme: Sensing Drifting and the Expert Driver Response (INVITED PRE-PUBLISHED JOURNAL PAPER)
Ines Rito Lima{2}, José Santos-Victor{1}
{1}Institute for Systems and Robotics ISR / LARSyS, Instituto Superior Técnico, Portugal; {2}Instituto Superior Técnico, Universidade de Lisboa, Portugal

5903: An Ultralow 6-µ W Analog Front-End for a Flexible OLED-µ LED-OPD PPG Patch by PPG-Gated PDM Emission to Sense Heart Rate (INVITED PRE-PUBLISHED JOURNAL PAPER)
Rajeev Kumar Pandey, Eka Fitrah Pribadi, Paul C.-P. Chao
National Yang Ming Chiao Tung University, Taiwan

5837: Cattle Trembling Detection Using HFR-Video-Based DIC Analysis
Tegar Palyus Fiqar, Feiyue Wang, Kohei Shimasaki, Idaku Ishii, Toshihisa Sugino
Hiroshima University, Japan

5881: Innovative Methods of Signal Processing for hydrogen-Filled Proportional Counters (INVITED PRE-PUBLISHED JOURNAL PAPER)
Aleš Horna{2}, Ondřej Kolář{1}, Michal Kubíček{1}, Tomáš Czakoj{3}, Michal Košťál{3}, Věra Mazánková{4}, Jiří Petr{2}, František Cvachovec{4}, Aleš Jančář{5}, Jan Král{2}, Václav Přenosil{2}, Zdeněk Matěj{2}
{1}Brno University of Technology, Czech Rep.; {2}Masaryk University, Czech Rep.; {3}Research Centre Řež, Czech Rep.; {4}University of Defence, Czech Rep.; {5}VF, a.s., Czech Rep.