



**12th International Conference on Sensors
and Electronic Instrumentation Advances (SEIA '2026)**

**8th International Conference on Microelectronic Devices
and Technologies (MicDAT '2026)**

Conference Programme

**30 September - 2 October 2026
Granada, Spain**



Message from Chairman

It is my great pleasure to welcome you to Granada, Spain, for the 12th *International Conference on Sensors and Electronic Instrumentation Advances (SEIA' 2026)*, and the 8th *International Conference on Microelectronic Devices and Technologies (MicDAT' 2026)*.

This conference umbrella brings together two closely connected scientific communities: researchers and engineers working in sensors, measurement systems, electronic instrumentation, microelectronic devices, optoelectronic systems, embedded intelligence, and related enabling technologies. The joint format provides an excellent opportunity to exchange ideas across disciplines and to explore how advances in sensing, microelectronics, artificial intelligence, and measurement science are shaping the next generation of intelligent systems.

The 2026 programme reflects this interdisciplinary vision. It includes keynote lectures, invited and regular presentations, a Zoom session, poster contributions, and scientific discussions covering a wide range of topics, from AI-enabled sensors, embedded IoT sensing systems, calibration and measuring technologies to optoelectronic systems, microelectronic devices, processing technologies, and emerging trends in microelectronics and sensing.

We are especially pleased to host this event in Granada, a city known for its history, culture, hospitality, and unique atmosphere. I hope that, in addition to the scientific sessions, participants will enjoy the Welcome Cocktail, Gala Dinner, Farewell Cocktail, and informal networking opportunities, which are an important part of every successful international conference.

On behalf of the Organizing Committee, I would like to express my sincere gratitude to all authors, keynote speakers, session chairs, reviewers, Advisory Committee members, sponsors, media partners, and the Conference and Publication Manager for their valuable contributions and support. Their efforts have made it possible to prepare a strong and diverse scientific programme.

I wish all participants a productive, inspiring, and enjoyable conference. May SEIA' & MicDAT' 2026 generate fruitful discussions, new collaborations, and lasting professional contacts.

Prof., Dr. Sergey Y. Yurish
Chairman

Conference Venue

The Conference Umbrella will take place on 30 September - 2 October 2026 in Barceló Granada Congress Hotel, Granada, Spain, Conference Room *Andalucia II+III*. Address: Calle Maestro Montero 12, 18004 Granada, Spain.

Insurance and Liability

The conference organizers accept no liability for any loss, damage, injury, illness, accident, delay, theft, or other incident affecting participants, accompanying persons, or their property in connection with attendance at the conference or related activities. Participants are solely responsible for arranging adequate personal, medical, travel, accident, liability, and property insurance as necessary. Attendance at the conference is at the participant's own risk.

Registration

The Registration Desk is open in the event Barceló Granada Congress Hotel:

- Tuesday, 29 September 2026, 20:00-21:00, in the Welcome Cocktail area in *Arrozante Terrace*
- Wednesday, 30 September 2026, 9:45-18:00, in the lobby near the *Andalucia II+III* conference room.
- Thursday, 1 October 2026, 9:45-18:00, in the lobby near the *Andalucia II+III* conference room.
- Friday, 2 October 2026, from 9:45-12:00, in the lobby near the *Andalucia II+III* conference room.

Language

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

Conference Identification Tag

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

Coffee/Tea Refreshment

Coffee/tea will be served in the lobby near the *Andalucia II+III* conference room at the times indicated in the programme.

Dress Code

The event dress code is smart casual for all conference sessions and social programme.

Welcome Cocktail

29 September 2026, Tuesday (20:00-21:00), The Welcome Cocktail (cold & hot aperitives (tapas) and drinks) will be served in *Arrozante Terrace* in Barceló Granada Congress Hotel. Do not miss this opportunity to say the first "hello" to attendees and committee members!

Gala Dinner

1 October 2026, Thursday (20:00-23:00). The Gala Dinner will take place in the ballroom (ground floor) in Barceló Granada Congress Hotel.

Farewell Cocktail

2 October 2026, Friday. The Farewell Cocktail will take place in the event hotel. It will be combined with the Poster Session and followed by the Closing Session. Do not miss it to know about the post-conference publications and the next conference's venue !

Post-Conference Publications

Selected and extended papers from the conference will be published in one of the indexed journals:

- *Sensors & Transducers* journal (ISSN: 2306-8515, e-ISSN 1726-5479), Special issue on '*Sensors & Measurement Systems*' by IFSA Publishing;
- *MDPI Sensors* (ISSN 1424-8220), by MDPI AG (Basel, Switzerland).

Authors will be also invited to extend their papers or/and articles into the book chapters for the '*Advances in Sensors*' Vol. 10, '*Advances in Measurements and Instrumentations*', Vol 4 or '*Advances in Microelectronics*', Vol. 4.

Best Papers Awards

In this year, two IFSA Best Paper Awards (Trophy, Certificate and free registration for the next conference edition for both: presenter and accompanying person) will be given to the authors of SEIA' 2027 and MicDAT' 2027 conferences at the Gala Dinner.

Organizing Committee

Chairman

Prof., Dr. Sergey Y. Yurish (*IFSA, Spain*)

Advisory Chairmen

Prof. Vincenzo Piuri (*Universit' degli Studi di Milano, Italy*)

Prof. José Miguel Pereira (*Instituto Politécnico de Setúbal, Portugal*)

Prof. George Kiriakidis (*European Materials Research Society, France*)

Prof. Gennaro Conte (*University Roma Tre, Italy*)

Prof. Arkady Zhukov (*University of the Basque Country, Spain*)

Prof. Vijyakumar Varadarajan (*Central Christian University, Malawi*)

Dr. Pavel Shuk (*Saint-Gobain NorPro, USA*)

Dr. Marius Gheorghe (*Ideal Aerosmith, Inc., USA*)

Dr. Paolo Dabove (*Politecnico di Torino, Italy*)

Conference and Publication Manager

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

Conferences' Web Sites:

- SEIA' 2026: <https://www.seia-conference.com>
- MicDAT' 2026: <https://www.micdat-conference.com>

Local Time

CEST — Central European Summer Time, UTC/GMT +2 hour

Keynote Speakers



Prof. Dr. Serey Y. Yurish
*International Frequency Sensors Association
(IFSA), Barcelona, Spain*

AI-Enabled Sensors for the Next Industrial Revolution: Technologies, Markets, and Future Opportunities

Abstract: AI-enabled sensors are emerging as a rapidly growing segment of the global sensor market, driven by advances in embedded AI, TinyML, edge computing, and digital twins. This presentation reviews the current market landscape, major application segments, growth drivers, and future commercial potential of intelligent sensing technologies. The keynote then focuses on an important technological limitation: AI sensors require a much higher level of integration, while conventional sensor architectures still rely heavily on analog components such as amplifiers, filters, voltage references, signal-conditioning circuits, and ADCs. These blocks consume chip area and power and become increasingly difficult to integrate efficiently in low-voltage deep-submicron CMOS technologies below 50 nm. As a possible solution, the presentation discusses frequency-output sensing elements combined with frequency-to-digital conversion, based on novel patented conversion methods. Such architectures can eliminate complex analog and mixed design of analog blocks and ADCs, improve level of integration and metrological performance, and release additional chip area for embedded AI. Finally, the keynote explores how these developments may enable the next industrial revolution, including Industry 6.0.

Short Biography: Prof., Dr. Sergey Y. Yurish has served as the president of the International Frequency Sensor Association (IFSA) - one of the major professional associations serving the sensor industry and academia since 1999. Dr. Yurish is a founder of three companies. He is editor-in-chief of the international peer-reviewed journal *Sensors & Transducers* and editor of several open access multivolume book series. Dr. Yurish has obtained his PhD degree in 1996 from the National University Lviv Polytechnic (UA). He has published more than 180 articles and papers in international peer-reviewed journals and conference proceedings. Dr. Yurish holds 9 patents and is an author and co-author of 12 books. He has delivered more than 90 speeches, tutorials and keynote presentations at industries, peer institutions, and professional conferences in more than 30 countries.



Dr. Michal Hodoň
*University of Žilina,
Slovakia*

Embedded IoT Sensing Systems: From Data Acquisition to Edge Intelligence

Abstract: The rapid evolution of embedded electronics, wireless communication, and artificial intelligence is transforming traditional sensor networks into intelligent IoT sensing systems capable of real-time monitoring and decision support. This keynote provides an overview of current trends in the design of embedded sensing platforms, covering sensor integration, low-power hardware, wireless connectivity, cloud-based data management, and edge intelligence. Recent advances in machine learning, digital twins, and distributed sensing architectures will be discussed together with their role in developing reliable, scalable, and sustainable monitoring systems for critical infrastructure, industrial automation, and smart environments.

Short Biography: Michal Hodoň received the Ph.D. degree in Technical Cybernetics from the University of Žilina, Slovakia, where he currently serves as Associate Professor and Deputy Head of the Department of Technical Cybernetics. His research focuses on embedded systems, Internet of Things (IoT), wireless sensor networks, industrial communication, edge artificial intelligence, environmental sensing, and intelligent monitoring systems for critical infrastructure. He has participated in numerous national and international research projects addressing smart sensing technologies, transportation safety, industrial automation, and intelligent building systems. He is the author and co-author of scientific publications in the fields of embedded sensing systems, machine learning, and intelligent sensor applications and serves on the program committees of several international conferences.

SEIA' & MicDAT' 2026 Programme at Glance Programme at Glance

Time/Date (UTC+2)	30.09.2026 Wednesday	1.10.2026 Thursday	2.10.2026 Friday
	<i>Andalucia II+III Conference Room</i>		
8:45-9:00	Registration	Registration	Registration
9:00-9:15	* Opening Session Sergey Y. Yurish (IFSA President)	* Daily announcements	* Daily announcements
9:15-10:00	Keynote Speaker I Sergey Y. Yurish IFSA President, Spain	Keynote Speaker II Michal Hodoň University of Žilina, Slovakia	Zoom Session Emerging Trends in Microelectronics and Sensing
10:00-10:30	<i>Coffee Break</i>	<i>Coffee Break</i>	<i>Coffee Break</i>
10:30-12:30	Regular Session: Sensors & Systems Design	Regular Session: AI-based Sensors & Applications	Zoom Session (continuation)
12:30-13:30	<i>Lunch on your own</i>	<i>Lunch on your own</i>	<i>Poster Session & Farewell Cocktail</i>
13:30-14:30	Regular Session: Sensor Calibrations, Materials & Technologies	Regular Session Optoelectronic Systems	* <i>Closing Session</i> Sergey Y. Yurish (IFSA President)
14:30-15:30			-
15:30-16:00	<i>Coffee Break</i>	<i>Coffee Break</i>	-
16:00-18:00	Regular Session: Measurements & Measuring Systems	Regular Session: Microelectronic Devices, Processing & Technologies	-
17:30-20:00	-	-	-
20:00-23:00	-	<i>Gala Dinner</i>	-

* The must attend sessions.

The time in the table and in the technical programme below is the local time in Granada – CEST (UTC+2).

Technical Conference Programme

Day 1

30 September 2026, Wednesday

Regular Session: Sensors & Systems Design

Chairman: Prof., Dr. Yasutaka Uchida
Teikyo University of Science, Japan

- 1. Dependence of Segment Anything Model (SAM) Performance on Part Geometry in Bin Picking Applications**
Marek Franaszek, Pavel Piliptchak and Kamel S. Saidi (*USA*)
- 2. Compact UVN + LWIR LIBS Instrument with Machine-Learning Analysis for Real-Time In-Situ Resource Identification on Lunar and Martian Surfaces**
Clayton Yang, Feng Jin, Sudhir Trivedi, Amber Benecchi and Thirimachos Bourlai (*USA*)
- 3. Impact of Sparsity and Algorithm Parameters on SFT-based Wideband Spectrum Sensing**
Nicolas Luberne (*France*)
- 4. Measurement Error Analysis of Eddy-Current Sensors Under Tilted Probe Installation**
Xufei Zhang, Tuo Xu and Lingkai Wu (*China*)
- 5. Resistance-Based Thermal Sensing and Heat Propagation Modeling of a PTC-Heated Shape Memory Alloy Actuator**
Daniel Arriaga-Ventura, Javier Izquierdo-Reyes and Rogelio Bustamante-Bello (*Mexico*)
- 6. AI-Based Virtual Sensors as Cybersecurity Mechanisms in Industrial IoT Systems: A Systematic Literature Review, Taxonomy, and Cyber-Resilience Framework**
(*pre-recorded video*)
Ivana Gabrišová, Gabriel Koman and Milan Kubina (*Slovakia*)

Regular Session: Sensors Applications, Calibrations & Technologies

Chairman: Dr. Marek Franaszek

National Institute of Standards & Technology, USA

- 1. Low-Complexity Trajectory Estimation for Table-Slide Rehabilitation Using an IMU Sensor**
Yasutaka Uchida, Eiichi Ohkubo, Manami Nishi
and Tomoko Funayama
(*Japan*)
- 2. Structural Optimization of a Circular Restoring Spring for a Low-Frequency Electromagnetic Standard Vibrator**
Xufei Zhang, Tuo Xu, Taotao Du and Mengchao Xu
(*China*)
- 3. Cost-Effective hybrid Raman-Infrared Non-Contact Thermometry for Industrial Process Monitoring**
Volodymyr Multian, Willem Rischau and Jérémie Teyssier
(*Switzerland*)
- 4. Ultra-Thin Inkjet-Printed Metal/Polymer Composite Strain Sensors for Wearable Health Monitoring**
Arshad Khan, Aditya Nittala, Shawkat Ali, Arshad Hassan
and Amine Bermak
(*Qatar and, Canada*)
- 5. Design and Evaluation of an ESP32-Based Wireless Sensor Network for Subsurface Temperature Monitoring in Road Energy-Harvesting Applications**
Tomáš Bača, Peter Šarafín, Ondrej Karpis and Matúš Formanek
(*Slovakia*)
- 6. A Fundamental Evaluation of a Ventilator Operation Education System Applying Eye-Tracking Technology**
(pre-recorded video)
Naoki Katsura, Shinichi Sakakida, Riona Kurihara, Yousuke Uchida,
Takahiro Wabe and Akimitsu Fujii
(*Japan*)

Regular Session: Measurements & Measuring Systems

Chairman: Prof., Dr. Xufei Zhang
Taiyuan University of Technology, China

- 1. A Cuffless Palm-Site On-Demand Continuous Blood Pressure Monitoring Prototype with Deep Learning-Based Estimation**
Iyappan Gunasekaran
(*Hong Kong*)
- 2. Fast Electrical Impedance Spectroscopy for Transient Dynamic Processes**
Lukas Lauritsch and Marco Da Silva
(*Austria*)
- 3. Current Status and Future Development of National Standard Time UTC (NTSC)**
Shuhong Zhao, Shanshan Bai, Yu Zhang
and Sufang Liu (*China*)
- 4. Design and Validation of a Time-Frequency Data Analysis and Data Processing Platform**
Yanrong Xue, Shuhong Zhao and Lingda Meng
(*China*)
- 5. Investigation of the Flow Rate Dependence of Blood Coagulation Measurement in an Extracorporeal Circulation Circuit Using LED Photoacoustic Imaging**
(pre-recorded video presentation)
Takahiro Wabe, Naoki Katsura, Yohsuke Uchida, Ryo Suzuki
and Akimitsu Fujii (*Japan*)
- 6. Long-term Objective Evaluation of Posture During Self-study Using Image Analysis Technology and Impact on Learning Effectiveness** (pre-recorded video)
Takahiro Wabe and Yasutaka Uchida
(*Japan*)

Day 2
1 October 2026, Thursday

Regular Session:
AI-based Sensors and Applications

Chairman: Dr. Michal Hodoň
University of Žilina, Slovakia

1. Utilization of Ultrasonic Anemometers for Acquiring Airflow Data in Tunnel Fire Spread Models

Michal Hodoň, Lukáš Formanek and Peter Danišovič
(Slovakia)

2. Distributed VOC and Environmental Monitoring System for Road Tunnel Applications

Michal Hodoň, Lukáš Formanek and Peter Danišovič
(Slovakia)

3. Wind Feature Engineering for Tree-Sway Energy Harvesting Assessment in Forest IoT Nodes

Peter Kolok, Ján Kapitulík, Miroslav Chochul and Ján Šumský
(Slovakia)

4. Hydrostat - Real-Time Monitoring of Water Quality Parameters

Michal Kubaščík, Andrej Tupý, Marek Tebeľák and Peter Ševčík
(Slovakia)

5. Design and Preliminary Validation of a Modular ESP32-H2 Sensor Node

Andrej Brnušák, Andrej Šimkovič, Peter Šarafín, Matúš Formanek and Tomáš Bača
(Slovakia)

6. Ultra-Low-Power Odor Classification on the ESP32-C6 Using Integer-Based Models

Michal Kubaščík, Peter Kolok, Lukáš Čechovič and Miroslav Chochul
(Slovakia)

Regular Session: Optoelectronic Systems

Chairman: Prof., Dr. Julian Gardner
University of Warwick, UK

1. A VLC Based Microelectronic Framework for MARL Coordinated Multi Intersection Traffic Control

Manuel Augusto Vieira, Manuela Vieira, Gonalo Galvo,
Paula Louro, Pedro Vieira and Mario Vestias
(Portugal)

2. Photonics Enabled Multimodal Traffic Control Using VLC and Multi Agent Reinforcement Learning (MARL)

Joo Matos, Manuela Vieira, Manuel Augusto Vieira,
Gonalo Galvo, Paula Louro and Astride Morais
(Portugal)

3. Visible Light Communication for Intelligent Traffic Control in a V2X Environment

Gonalo Galvo, Manuela Vieira, Manuel Augusto Vieira,
Paula Louro and Mario Vestias
(Portugal)

4. Visible Light Communication-Based Traffic Management for Autonomous Guided Vehicles in Automated Warehouses

Paula Louro, Gonalo Galvo, Manuel A. Vieira and Manuela Vieira
(Portugal)

5. FPGA Implementation of Zonotopic Estimation for Linear Systems: Algorithmic Structure and Hardware-Oriented Design

Zihan Zhang, Kyriakos Deliparaschos, Gabriele Oliva
and Ningning Wang
(China, Cyprus and Italy)

6. Comparative Neural Forecasting of Automated Process Dynamics in Microelectronics (pre-recorded video presentation)

Ronald Ssali and Vincent Mawanda
(Uganda and Russia)

Regular Session: **Microelectronic Devices, Processing & Technologies**

Chairman: Prof., Dr. Manuela Vieira
ISEL-IPL /UNINOVA-CTS and LASI, Portugal

- 1. Active-only Current-Controlled Memcapacitor Emulator Circuit**
Hacer Atar Yildiz and Elham Minayi
(*Turkey*)
- 2. A Low-Voltage Low-Power Oscillator-Based Rectifier for Biomedical Implantable Devices in 0.18 μm Technology**
Mojtaba Daliri
(*Iran*)
- 3. Analysis and Pre-Silicon Verification of a FDC-based CT Detector IC with Integrated Photodiode**
Angel Sánchez Navarro, Sébastien Poirier
and Marcos Martínez-Peiró
(*Spain*)
- 4. Investigation of Harmonic Distortion in high speed SiGe HBT Power Cells at Cryogenic Temperatures**
Paulius Sakalas
(*Germany*)
- 5. Effect of Ambient Conditions on Hydrogen Response of Graphene-Based Chemiresistor**
Julian Gardner
(*UK*)
- 6. Optimizing Electrical Conductivity in Amorphous GeSn Thin Films via Thermally Activated Sn Diffusion** (pre-recorded video)
Jael Marisol Carmona-Sánchez, Jhonny Tiscareño-Ramírez, Víctor Aca Aca, Armando Hernández Flores, José Juan Aviles Bravo, Ignacio Juárez Ramírez, Dan Buca and Alfonso Torres Jacome
(*Mexico and Germany*)

Day 3
2 October 2026, Friday

Zoom Session:
Emerging Trends in Microelectronics and Sensing

Chairman: Prof., Dr. Sergey Y. Yurish

International Frequency Sensor Association (IFSA), Barcelona, Spain

1. Spatially-Resolved Conductivity Mapping Method for Brittle and Rough Electrode Materials under High Electric Field Conditions

Daniel Otto, Michael Eiserbeck, Daniel Käßler and Gerold Bausch
(Germany)

2. Deep Latent Clustering of Kinematic Waveforms for Unbiased Functional Profiling

Shmuel Amour and Sara Rosenblum
(Israel)

3. Wearable Heartbeat Sensors from Laser Induced Graphene on a Poly(dimethylsiloxane) Substrate with Poly(ethylene glycol) and Triton X Additives

Marko Spasenovic, Andjela Gavran, Miona Tomic, Ivan Pesic, Teodora Vićentić and Marija Pergal
(Serbia)

4. Predictive Anemometric Surveillance: Forecasting the IEC 61400-12-1 Annex K Wind-Speed Discrepancy for Proactive Sensor Fault Detection

Maximo Paz Iaconis Sabato, Lucas Carmusciano and Juan Manuel González Kapnik
(Argentina)

5. Future Transformation Prediction of Land Use/Land Cover Using Machine Learning and Neural-Network-Based Transition Potential Modeling in the Middle Rio Grande Region 2025-2040

Omar Sulaiman Belhaj
(USA)

- 6. A Deterministic On-Demand Simulation Framework for Parametric Analysis of Coincidence-Based Frequency Measurement** (pre-recorded video)
Daniel Avalos-Gonzalez, Misael Reyes I., Saúl Islas-Pereda, José M. Ramírez, Blanca Dalila Pérez-Pérez, Marlene Zamora-Machado and Luis Martínez-Quintero
(Mexico)
- 7. A Low-Cost SDR-Based Telecommunications Laboratory Using Repurposed TV Boxes** (pre-recorded video)
Arquimedes da Silva
(Brazil)
- 8. A Comparative Study of Variational Autoencoder Architectures for Anomaly-Based Fault Detection in Real-World Industrial Control Systems** (pre-recorded video)
Ietezaz UI Hassan, Krishna Panduru, Daniel Riordan and Joseph Walsh
(Ireland)
- 9. Application of Non-equilibrium Green's Functions (NEGF) to Study Optical Properties of Semiconductor Lasers Based on Quantum Wells**
Marek Wartak
(Canada)

Poster Session:

- 1. Estimating Outdoor Eye-Level Daylight Exposure from Satellite Data: Protocol for a Proof-of-Concept Experiment**
Sietse de Vries, John Mardaljevic, Helianthe Kort
and Juliëtte van Duijnhoven
(*Netherlands and UK*)
 - 2. Simulation-Based Study of a GMR Sensor Device for Event-Driven Tracking of Magnetic Microparticles**
Arman Shahryari, Càndid Reig, Fernando Pardo Carpio,
Jose A. Boluda, Ruben Afonso and Susana Cardoso
(*Spain and Portugal*)
 - 3. Computer Vision Analysis of Sanding Marks in Wood**
Miguel Colina, Javier Ramos, Luis Marín and Càndid Reig
(*Spain*)
 - 4. Deterministic Modeling and Advanced Micro-Doppler (μ D) Analysis of Quadrotor Drones in the X-Band**
Aymeric Le Dréo, Ali Khenchaf, Jean-Christophe Cexus
and Philippe Pouliguen
(*France*)
 - 5. Atmospheric Hydrometeor Monitoring Using 24 GHz Microwave Attenuation**
Byung Hyuk Kwon and Ziwoo Seo
(*South Korea*)
 - 6. High-Efficiency Blue Top-Emission OLED with a DBR Capping Layer and Metal–Dielectric–Metal Electrode Hybrid Structure**
Kyo-Cheol Kang, Je-Wook Shin, Jun-Young Park, Jong Seong Lee
and Byeong-Kwon Ju
(*South Korea*)
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