



CONFERENCE PROGRAM

2025 INTERNATIONAL WORKSHOP

**BIOMEDICAL APPLICATIONS,
TECHNOLOGIES AND SENSORS**

OCTOBER 27-28, 2025

UNIVERSITÀ CAMPUS BIO-MEDICO DI ROMA


BATS

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IEEE BATS 2025 Keynote Speakers

Plenary Session - Monday October 27 - H 14:00



Advancing Optical Sensors: from Robotics to Bio Applications - Latest research

Carlos Marques

University of Aveiro, Portugal

ABSTRACT

At CICECO – Aveiro Institute of Materials, within the Optical Sensing and Devices Group, our research is dedicated to the design and application of cutting-edge optical sensors tailored for biomedical, environmental, aerospace, and robotic systems. By harnessing the distinctive advantages of optical fibers and advanced photonic materials—such as flexibility, biocompatibility, high sensitivity, and immunity to electromagnetic interference—we focus on developing high-performance sensing solutions for bio diagnostics and monitoring. Our interdisciplinary work bridges the gap between technological innovation and healthcare, driving forward digital health solutions that promote human well-being and contribute to a more sustainable future.

SPEAKER BIOGRAPHY

Carlos Marques is a professor and researcher at the University of Aveiro (Physics Department), affiliated with the Optical Sensing and Devices Group at CICECO – Aveiro Institute of Materials. His research focuses on the development of advanced optical sensors for biomedical, aerospace, and robotic applications, aiming to translate photonic technologies into impactful health and environmental solutions. He has an h-index of 74 (google scholar: +13000 citations), reflecting his strong publication track record. Throughout his career, he has received several scientific awards including a Marie Curie Individual Fellowship and has coordinated or participated in national and international R&D projects in the field of optical sensing and smart materials.



Towards Continuous User Authentication: Wearable Sensors for Biometric Recognition

Emanuele Maiorana

Roma Tre University, Italy

ABSTRACT

Wearable sensor, once niche tools for fitness tracking, are now emerging as powerful enablers of several applications. While most of them are associated to medical purposes, these devices can be exploited to implement novel paradigms in many fields, including biometric user recognition. Actually, as our digital lives become increasingly integrated with mobile and ubiquitous computing, the need for secure and seamless user authentication is more critical than ever. For instance, capabilities such as continuous user recognitions are highly needed in frameworks such as access control for services available in the metaverse. This keynote explores how physiological and behavioral biometric data captured passively by wearables can be leveraged to move beyond one-time authentication to persistent, context-aware identity verification. Considering recent advancements in this field, we will examine how signals such as photoplethysmograms (PPG) and seismocardiograms (SCG) can serve as distinctive biometric markers, and how machine learning algorithms can transform raw sensor data into reliable authentication mechanisms. Alongside showcasing current breakthroughs and applications, this talk will also address critical challenges including data variability, privacy concerns, and real-world deployment constraints.

SPEAKER BIOGRAPHY

Emanuele Maiorana (Senior Member, IEEE) received the Ph.D. degree from Roma Tre University, Rome, Italy, in 2009, with European Doctorate Label. He is currently an Assistant Professor (tenure track) with the Department of Industrial, Electronic, and Mechanical Engineering, Roma Tre University. His research interests include digital signal and image processing, with a specific emphasis on biometric recognition. He is the recipient of the Lockheed Martin Best Paper Award for the Poster Track at the IEEE Biometric Symposium 2007, the Honeywell Student Best Paper Award at the IEEE Biometrics: Theory, Applications and Systems conference 2008, and the Best Paper Award at the International Conference on Pattern Recognition Applications and Methods (ICPRAM). He was the General Chair of the 9th IEEE International Workshop on Biometrics and Forensics (IWBF) in 2021, and of the 16th IEEE International Workshop on Information Forensics and Security (WIFS) in 2024. He is the Chair of the IEEE Italy Section Biometrics Council Chapter. He is an Associate Editor of IEEE Transactions on Information Forensics and Security and IEEE Open Journal on Signal Processing.

Plenary Session - Tuesday October 28 - H 14:00



Gas Sensor Technologies and Machine Learning for Early Cancer Diagnostics

Donatella Puglisi

Linköping University, Sweden

ABSTRACT

Cancer ranks as the second leading cause of death in EU countries after cardiovascular diseases, with 2.6 million annual diagnoses and 1.2 million premature deaths. The economic impact reaches €100 billion yearly in Europe, necessitating more resilient health systems that ensure equitable access to cancer care.

Ovarian cancer is one of the most lethal gynecological malignancies, primarily due to its asymptomatic onset and subsequent delay in diagnosis. Most cases are identified at advanced stages, when treatment options are complex and limited, and survival outcomes are poor. With 324,000 new cases and 206,000 deaths globally in 2022, projections indicate increasing incidence by 2050. Early detection can dramatically change the prognosis of patients, increasing the five-year survival rate from 4% at stage IV to 90% at stage I. Current diagnostic methods such as serum biomarkers (CA125 and HE4), transvaginal ultrasound, computed tomography, and biopsy lack efficiency for large-scale routine screening due to insufficient sensitivity and specificity, invasiveness, cost, and complexity of data interpretation. The development of new reliable, rapid, and minimally invasive diagnostic technologies is essential to improve early detection, diagnostic capabilities, and clinical outcomes, as well as to increase patient survival rates and quality of life, thus ensuring high-quality standards of public health and health systems.

Here, we present a rapid, accurate, and non-invasive diagnostic strategy based on volatile organic compound profiling from blood plasma, using a 32-element metal oxide semiconductor-based electronic nose coupled with advanced machine learning techniques. Samples were collected in 1 ml aliquots, stored frozen under standard conditions, and thawed immediately prior to measurement at ambient temperature. Each measurement lasted 10 minutes. Custom feature extraction and sensor utility metrics enabled the development of a boosting-based ensemble model that achieved 97% sensitivity and 97% specificity in distinguishing ovarian cancer patients from healthy controls. A majority-vote classification framework attained 100% patient-level accuracy. Beyond binary classification, our approach accurately identifies cancer stages and differentiates ovarian from endometrial cancer, demonstrating its broad diagnostic utility. This portable, rapid, and easy-to-use system offers a scalable solution for early cancer detection, with extensive application potential in the biomedical field.

SPEAKER BIOGRAPHY

Donatella Puglisi, PhD, Associate Professor of Applied Physics at Linköping University, Sweden, specializes in interdisciplinary and international research and innovation projects spanning different scientific domains within applied sciences and engineering. Her research focuses on the development and operation of innovative gas sensing devices and machine learning-enhanced electronic noses for advanced odor detection, with a focus on volatile organic compounds. She has been a principal investigator or investigator of over 25 collaborative research and innovation projects in the fields of early cancer diagnostics and other biomedical applications, forensic investigations, cultural heritage preservation, food quality assessment, indoor air quality and environmental monitoring. She has also participated in several research projects and networks at local, national, and international levels as an advisory board member, external expert, working group member, or research collaborator. She is author of 65 papers on international journals and two book chapters, and has contributed to over 100 conferences and workshops, serving on organizing committees, technical program committees, advisory boards, and as session chair and invited, keynote, or plenary speaker. Her research interests extend beyond academia, also focusing on technology transfer and collaboration with industry, research centers, government agencies, and civil society.

Puglisi is a member of the International Steering Committee of EUROSENSORS and co-founder and board member of NORNDiP, the Nordic Network for Diversity in Physics, for the promotion and valorization of diversity, inclusion, equal opportunities, and female leadership in science. In 2019, she was awarded the Åforsk Entreprenörstipendium as one of the 10 Sweden's most innovative entrepreneurs of the year.

Program Schedule - Monday, October 27

MONDAY OCTOBER 27		
11:00 - 12:00	Technical Visit - Simulation Center at UCBM	
14:00 - 14:10	OPENING CEREMONY - WELCOME ADDRESSES Auditorium CuBo , Via Álvaro del Portillo, 21	
14:10 - 14:55	KEYNOTE LECTURE - Advancing Optical Sensors: from Robotics to Bio Applications - Latest research Carlos Marques, University of Aveiro, Portugal Auditorium CuBo , Via Álvaro del Portillo, 21	
	Room #1 UCBM Academy, via G. Dina 36	Room #2 UCBM Academy, via G. Dina 36
15:00 - 15:45	S1.1 - General Session - PART I	S1.2 - SS#5 - AI-Driven Wearable and Implantable Sensors and Instrumentation - PART I
15:45 - 16:45	S2.1 - SS#2 - Applications of Sensors and Measuring Techniques in Occupational and Sports Fields - PART I	S2.2 - SS#6 - Optic and Electronic Sensors for Real-Time Physiological Monitoring - PART I
16:45 - 17:30	COFFEE BREAK	
17:30 - 19:15	S3.1 - SS#2 - Applications of Sensors and Measuring Techniques in Occupational and Sports Fields - PART II	S3.2 - SS#3 - From Bench to Bedside: Sensors in Clinical Practice
20:00 - 23:00	GALA DINNER - "La Mandria" Restaurant, Via Laurentina, 1600, Rome	

Program Schedule - Tuesday, October 28

TUESDAY OCTOBER 28		
08:45 - 09:30	KEYNOTE LECTURE - Towards Continuous User Authentication: Wearable Sensors for Biometric Recognition Emanuele Maiorana, Roma Tre University, Italy Sala Conferenze - PRABB, Via Álvaro del Portillo, 21	
	Sala Conferenze - PRABB Via Álvaro del Portillo, 21	Aula R1 - PRABB Via Álvaro del Portillo, 21
09:45 - 10:45	S4.1 - General Session - PART II	S4.2 - SS#7 - Measurement Tools and Techniques in Biomechanics and Biomedical Applications - PART I
10:45 - 11:15	COFFEE BREAK	
11:15 - 12:30	S5.1 - SS#1 - Low-noise electronic circuits for bio-signal applications	S5.2 - SS#7 - Measurement Tools and Techniques in Biomechanics and Biomedical Applications - PART II
12:30 - 14:00	LUNCH	
14:00 - 14:45	KEYNOTE LECTURE - Gas Sensor Technologies and Machine Learning for Early Cancer Diagnostics Donatella Puglisi, Linköping University, Sweden Sala Conferenze PRABB - Via Álvaro del Portillo, 21	
	Sala Conferenze - PRABB Via Álvaro del Portillo, 21	Aula R1 - PRABB Via Álvaro del Portillo, 21
15:00 - 16:00	S6.1 - SS#4 - Intelligent Electronic Measurement Systems for Quality and Safety in Biomedical Applications	S6.2 - SS#5 - AI-Driven Wearable and Implantable Sensors and Instrumentation - PART II
16:00 - 16:30	COFFEE BREAK	
16:30 - 17:15	S7.1 - General Session - PART III	S7.2 - SS#6 - Optic and Electronic Sensors for Real-Time Physiological Monitoring - PART II
17:15 - 17:30	CLOSING CEREMONY	

Technical Program - Monday, October 27

10:00 - 18:00	UCBM Accademy (via G. Dina) REGISTRATIONS
11:00 - 12:00	Simulation Center at UCBM TECHNICAL VISIT - SIMULATION CENTER
14:00 - 14:10	Auditorium CuBo, Via Álvaro del Portillo, 21 OPENING CEREMONY - WELCOME ADDRESSES
Welcome Addresses - Simonetta Filippi, <i>Vice Rector for Academic Development</i> Presentation of the Workshop - Antonino S. Fiorillo, Emiliano Schena, <i>BATS 2025 General Chairs</i>	
14:10 - 14:55	Auditorium CuBo, Via Álvaro del Portillo, 21 PLENARY SESSION - KEYNOTE LECTURE Chair: Stefania Campopiano, <i>University of Naples "Parthenope", Italy</i>

Advancing Optical Sensors: from Robotics to Bio Applications Latest research

Carlos Marques, *University of Aveiro, Portugal*

15:00 - 15:45	Room #1 - UCBM Accademy (via G. Dina) Session 1.1 - General Session Chair: Salvatore A. Pullano, <i>"Magna Græcia" University of Catanzaro</i>
15:00	Evaluation of a Novel Automated Method for the Quantification of Inflammation in Renal Biopsies Veronica Mattioli; Andrea Bocchi; Elena Martinelli; Chiara Pala; Marco Delsante; Umberto Maggiore; Riccardo Raheli
15:15	Physiological and Neurofunctional Adaptations to Robotic-Assisted Gait Therapy in Cerebral Palsy: A Double Case Study Francesco Romano; Elena Campili; David Perpetuini; Emanuele Francesco Russo; Maria Teresa Gatta; Teresa Paolucci; Marta Di Nicola; Arcangelo Merla; Giovanni Morone; Antimo Moretti; Daniela Cardone

- 15:30 Photoionization Sensor for VOC Detection in Tomato Seed Oil**
Giuseppe Oliva; Laura Manin; Filippo Laganà; Antonino S. Fiorillo; Salvatore Andrea Pullano

15:00 - 15:45 Room #2 - UCBM Accademy (via G. Dina)
Session 1.2 - AI-Driven Wearable and Implantable Sensors and Instrumentation - PART I
Chair: Domenico Caputo, *Sapienza University of Rome, Italy*

- 15:00 TremorCap: a Wearable & Edge-Driven ML System for Real-Time Tremor Suppression**
Vedant Mangrulkar; Madhav Rao

- 15:15 A Flexible Wearable Sensor with Machine Learning Augmentation for Physical Activity Monitoring**
Sabiha Sharmin; Shahrin Akter; Mohammad R Haider; Syed Islam

- 15:30 A Low-Cost Wearable Flexible Sensor with an Ag-hBN Interface for Respiratory Monitoring**
Tasnim Zaman Adry; Sabiha Sharmin; Syed Islam; Mohammad R Haider

15:45 - 16:45 Room #1 - UCBM Accademy (via G. Dina)
Session 2.1 - Applications of Sensors and Measuring Techniques in Occupational and Sports Fields - PART I
Chairs: Carlo Massaroni, Chiara Romano, *University Campus Bio-Medico of Rome, Italy*, Alessandro Ledda, *University of Rome "Foro Italico", Italy*

- 15:45 Effect of Psychophysical Stress on Cardiac Ventricular Activity in Short-Distance Runners During Training and Competition**
Agnese Sbröllini; Sofia Romagnoli; Micaela Morettini; Massimo Colaneri; Marco Pozzi; Laura Burattini

- 16:00 Design, Development and Characterization of a 3D Printed Fixed and Variable Orifice Flowmeter**
Vincenzo Saroli; Sergio Silvestri; Emiliano Schena; Carlo Massaroni

- 16:15 Assessment of Single-Lead ECG Signal Quality in Wearable Devices: a Comparative Study of Chest Straps and Adhesive Patches**
Chiara Romano; Daniela Lo Presti; Sergio Silvestri; Annunziata Nusca; Gian Paolo Ussia; Emiliano Schena; Carlo Massaroni

- 16:30 Signal Quality and Clinical Accuracy of a Low-Cost Equine ECG System Using Arduino Hardware**
MHD Jafar Mortada; Filippo Cinti; Meri Gjika; Peter M.van Dam; Laura Burattini; Agnese Sbröllini

15:45 - 16:45	<i>Room #2 - UCBM Accademy (via G. Dina)</i> Session 2.2 - Optic and Electronic Sensors for Real-Time Physiological Monitoring - PART I Chairs: Michele Riccio, <i>University of Naples Federico II, Italy</i>, Elena De Vita, <i>University of Naples "Parthenope", Italy</i>
15:45	Pulse Wave Analysis Based on Fiber Bragg Gratings Mariaconsiglia Cuomo; Maria Gragnaniello; Elena De Vita; Vincenzo Romano Marrazzo; Giovanni Breglio; Agostino Iadicicco; Michele Riccio; Stefania Campopiano
16:00	A Power Efficient Wearable Solution for Sleep Apnea Diagnosis Based on Tracheal Sounds and on-Device AI Maria Gragnaniello; Federica Mariani; Alessandro Borghese; Vincenzo Romano Marrazzo; Giovanni Breglio; Andrea Irace; Michele Riccio
16:15	A Force Sensor-Based Approach for Continuous Blood Pressure Monitoring on Wearable Devices Maria Gragnaniello; Emilio Andreozzi; Daniele Esposito; Jessica Centracchio; Giovanni Breglio; Andrea Irace; Michele Riccio
16:30	Spectral Analysis of AVF Signals for Early Dysfunction Detection: Towards AI-Based Home Monitoring Rosalba Liguori; Giuseppe Longo; Luigi Di Benedetto; Gian Domenico Licciardo, Prof.; Jessica Centracchio; Salvatore Parlato; Eliana Cinotti; Emilio Andreozzi; Francesco Bonavolontà; Annalisa Liccardo; Pasquale Zamboli; Massimo Punzi; Giovanna Capolongo
16:45 - 17:30	<i>UCBM Accademy (via G. Dina)</i> COFFEE BREAK
17:30 - 19:15	<i>Room #1 - UCBM Accademy (via G. Dina)</i> Session 3.1 - Applications of Sensors and Measuring Techniques in Occupational and Sports Fields - PART II Chairs: Mariangela Pinnelli, <i>Università Campus Bio-Medico di Roma, Italy</i>, Maria Rosaria Fizzano, <i>INAIL, Italy</i>, Fabrizio Marra, <i>Sapienza University of Rome, Italy</i>
17:30	IoT-Enabled Headband for Real-Time Concussion Monitoring in Amateur Rugby Soumya Kanti Manna; M A Hannan Bin Azhar; Tim Cunio Browne; Eithne O'Sullivan; Kristy Howells
17:45	Development of a Smart Measurement System Based on Textile Sensors for Human Presence and Fall Detection Vincenzo Lavorgna; Tommaso Giannini; Daniela Lo Presti; Emiliano Schena; Carlo Massaroni

- 18:00 Standard-Compliant Validation of a Smart Modular Add-on for Respiratory Protective Equipment: Design, Integration, and Functional Impact Assessment**
Mariangela Pinnelli; Carlo Massaroni; Fabrizio Marra; Alessandro Ledda; Emiliano Schena; Maria Sabrina Sarto
- 18:15 Multi-Material 3D Printing of a Flexible Sensor Based on TPU and CB-TPU for Tennis Player Joint Movement: A Preliminary Study**
Vincenzo Saroli; Giulia Paciotti; Sergio Silvestri; Emiliano Schena; Carlo Massaroni
- 18:30 In-Field Gait and Jump Analysis in Football Players with Wearable IMUs: a Real-World Validation Study**
Giuseppe Longo; Rosalba Liguori; Gabriele Santicchi; Susanna Stillavato; Luigi Di Benedetto; Gian Domenico Licciardo, Prof.; Matteo Zago; Alfredo Rubino; Lorenzo Airolidi
- 18:45 Integrating PPE and IoT: Technical, Regulatory and Organizational Perspectives**
Maria Rosaria Fizzano; Alessandro Ledda; Mara Stefanelli; Calogero Vitale; Emiliano Schena; Carlo Massaroni; Mariangela Pinnelli; Davide Giordani
- 19:00 Artificial Intelligence Applications in Personal Protective Equipment: Bibliometric Insights and Evolution Patterns (2020-2025)**
Alessandro Ledda; Maria Rosaria Fizzano; Mara Stefanelli; Enrico D'Emilia; Emiliano Schena; Carlo Massaroni; Mariangela Pinnelli; Davide Giordani

17:30 - 18:45 Room #2 - UCBM Accademy (via G. Dina)
Session 3.2 - From Bench to Bedside: Sensors in Clinical Practice
Chairs: Emiliano Schena, Daniela Lo Presti, Martina Pulcinelli, Antonella Grasso, Antonio Di Zazzo, Valeria Tomarchio, *Università Campus Bio-Medico di Roma, Italy*; Cátia Leitão, *University of Aveiro, Portugal*

- 17:30 Multiparametric Wearable System Based on Fiber Bragg Grating Sensor to Monitor Dengue Clinical Manifestations**
Isabel Del Pilar Moscol; Carlos Ojeda; Mario Quinde; Valeria Tomarchio; Ombretta Annibali; Carlo Massaroni; Emiliano Schena; Daniela Lo Presti
- 17:45 A Multi-Sensor Wearable Belt Based on Fiber Bragg Grating Sensors for Cardiorespiratory Monitoring**
Ilaria Condo; Carlo Massaroni; Sara Maria Giannitelli; Marcella Trombetta; Emiliano Schena; Daniela Lo Presti
- 18:00 An FBG-Based Soft Wearable System for Force Monitoring During Lymph Node Palpation**
Martina Pulcinelli; Valeria Tomarchio; Ombretta Annibali; Luigi Rigacci; Carlo Massaroni; Emiliano Schena; Daniela Lo Presti
- 18:15 Non-Invasive Pulse Wave Monitoring on the Carotid Artery Using an Optical Fiber-Based Sensor**
Nicole Teixeira; Cátia Leitão; Daniela Lo Presti; Paulo Antunes; José Mesquita-Bastos

- 18:30 A Ring-Shaped Flexible Sensor Based on FBG Technology for Detecting PWV in an Arterial Surrogate with Variable Stiffness: A Preliminary Study**
Federico Filippi; Isabel Del Pilar Moscol; Giorgia Fiori; Arianna Carnevale; Marta Cecchitelli; Carlo Massaroni; Emiliano Schena; Salvatore Andrea Sciuto; Daniela Lo Presti; Andrea Scorza

20:00 - 23:00 *"La Mandria" Restaurant, Via Laurentina, 1600, Rome*
GALA DINNER

Technical Program - Tuesday, October 28

08:30 - 17:00 *PRABB - Via Álvaro del Portillo, 21*
REGISTRATIONS

08:45 - 09:30 *Sala Conferenze PRABB - Via Álvaro del Portillo, 21*
PLENARY SESSION - KEYNOTE LECTURE
Chair: Carlo Massaroni, *University Campus Bio-Medico of Rome, Italy*

**Towards Continuous User Authentication:
Wearable Sensors for Biometric Recognition**

Emanuele Maiorana, *Roma Tre University, Italy*

09:45 - 10:45 *Sala Conferenze - PRABB - Via Álvaro del Portillo, 21*
Session 4.1 - General Session - PART II
Chair: Pisana Placidi, *University of Perugia, Italy*

- 09:45 Experimental Performance Assessment and Comparison of IMU-Equipped Wearable Devices for Gait Analysis**
Veronica Mattioli; Marco Sanfelici; Marta Bettini; Luca Davoli; Laura Belli; Riccardo Raheli; Gianluigi Ferrari
- 10:00 Two-Color Sensor for Lab-on-Chip Applications**
Fabio Cappelli; Giuly Petrucci; Martina Baldini; Nicola Lovecchio; Francesca Costantini; Massimo Reverberi; Augusto Nascetti; Giampiero De Cesare; Domenico Caputo
- 10:15 Identifying Biomarkers for Spinal Muscular Atrophy: a System Biology-Based Approach**
Kiana Mahtabi Nourani; Hasan Demirel; Adil Seytanoglu
- 10:30 From Concept to Prototype: Designing an Assistive Device for Multicompartmental Knee Osteoarthritis**
Safa Afzal; Soumya Kanti Manna; M A Hannan Bin Azhar

09:45 - 10:45	<i>Aula R1 - PRABB - Via Álvaro del Portillo, 21</i> Session 4.2 - Measurement Tools and Techniques in Biomechanics and Biomedical Applications - PART I Chairs: Arianna Carnevale, Letizia Mancini, <i>Fondazione Policlinico Universitario Campus Bio-Medico, Italy</i>, Claudio Belvedere, <i>IRCCS Istituto Ortopedico Rizzoli, Italy</i>
09:45	Numerical Study on the TEM Cell as a Possible Multifrequency Glucose Sensor Giacomo Giannetti; Stefano Maddio; Stefano Selleri
10:00	Investigations on a CSRR-Based Bio-Sensor for Dielectric Characterization of Blood Giacomo Giannetti; Stefano Maddio; Giovanni Lasagni; Marco Badii; Monica Righini; Stefano Selleri
10:15	Synergistic Muscle Activation Patterns in Shoulder Strength Testing Using sEMG Carla Antonacci; Arianna Carnevale; Letizia Mancini; Alessandro de Sire; Pieter D'Hoghe; Carlo Massaroni; Rocco Papalia; Emiliano Schena; Umile Giuseppe Longo
10:30	Mechanical Properties of Paediatric Trachea-Shaped Specimens: A Preliminary Quality Assessment Marta Cecchitelli; Giorgia Fiori; Luca Borro; Annalisa Genovesi; Massimiliano Barletta; Jan Galo; Aurelio Secinaro; Salvatore Andrea Sciuto; Andrea Scorza
10:45 - 11:15	<i>PRABB - Via Álvaro del Portillo, 21</i> COFFEE BREAK
11:15 - 12:30	<i>Sala Conferenze - PRABB - Via Álvaro del Portillo, 21</i> Session 5.1 - Low-noise electronic circuits for bio-signal applications Chairs: Giuseppe Ferri, <i>University of L'Aquila, Italy</i>, Marco Santonico, Giorgio Pennazza, <i>Università Campus Bio-Medico di Roma, Italy</i>
11:15	Superconducting Nanowires Single Photon Detectors for High-Resolution Time Biomedical Applications Francesco Mattioli; Francesco Martini; Fabio Chiarello; Francesco Conidi; Ajeethkumar Rengarajan; Alessandro Gaggero
11:30	Electronic Interfaces for Biofluids Digitalization with an Unobtrusive Sensor System Alessandro Zompanti; Gaetano Rocco; Giorgio Pennazza; Davide Ciarrocchi; Ludovica La Monica; Raffaele Antonelli Incalzi; Giuseppe Ferri; Riccardo Olivieri; Marco Santonico
11:45	A Low-Noise VCII for Biosignal Conditioning Riccardo Olivieri; Gianluca Barile; Vincenzo Stornelli; Alessandro Zompanti; Marco Santonico; Giuseppe Ferri
12:00	Interface Electronics for PVDF Based Tactile Sensor Mohamad Yaacoub; Riccardo Test; Ali Ibrahim; Daniele D. Caviglia; Maurizio Valle

12:15 Electronic Techniques for Distance-Independent Contactless Interrogation of a Passive Sensor Unit based on a Resistive Sensing Element

Marco Zini, Alessandro Nastro, Marco Baù, Marco Ferrari, Vittorio Ferrari

11:15 - 12:15 *Aula R1 - PRABB - Via Álvaro del Portillo, 21*

Session 5.2 - Measurement Tools and Techniques in Biomechanics and Biomedical Applications - PART II

Chairs: Arianna Carnevale, Letizia Mancini, *Fondazione Policlinico Universitario Campus Bio-Medico, Italy*, Claudio Belvedere, *IRCCS Istituto Ortopedico Rizzoli, Italy*

11:15 Novel Measurements for Three-Dimensional Characterization in Weight-Bearing Conditions of the Flat Foot Before and After Corrective Surgery

Giulio Sacchetti; Alberto Leardini; Lisa Berti; Maurizio Ortolani; Marco Miceli; Claudio Belvedere

11:30 Effect of Arm Support as a Compensatory Mechanism on Knee Joint Kinetics During Sit-to-Stand in Patients with Osteoarthritis

Letizia Mancini; Giovanni Spallone; Arianna Carnevale; Carla Antonacci; Stefano Campi; Alessandro de Sire; Pieter D'Hoghe; Carlo Massaroni; Rocco Papalia; Emiliano Schena; Umile Giuseppe Longo

11:45 A Straightforward IMU-Based Upper Limb Inverse Kinematics Compared with Open-Source Vision Algorithms

Giuseppe Longo; Alessandro Sicilia; Emanuele Bergamo; Walter Zigliotto; Giorgio Barzon; Alfredo Rubino; Alessandro Ruggiero; Rosalba Liguori

12:00 A Framework for Estimating Shoulder Joint Angle Using Thermal Videos

Martina Sassi; Arianna Carnevale; Emiliano Schena; Giuseppe Fico; Umile Giuseppe Longo; Leandro Pecchia

12:30 - 14:00 *PRABB - Via Álvaro del Portillo, 21*
LUNCH

14:00 - 14:45 *Sala Conferenze PRABB - Via Álvaro del Portillo, 21*

PLENARY SESSION - KEYNOTE LECTURE

Chair: Domenico Caputo, Sapienza University of Rome, Italy

Gas Sensor Technologies and Machine Learning for Early Cancer Diagnostics

Donatella Puglisi, *Linköping University, Sweden*

15:00 - 16:00 *Sala Conferenze - PRABB - Via Álvaro del Portillo, 21*
Session 6.1 - Intelligent Electronic Measurement Systems for Quality and Safety in Biomedical Applications
Chair: Salvatore Calcagno, *Mediterranea University, Reggio Calabria, Italy*

- 15:00 Development of a Sensor-Based System for Rainwater Monitoring**
Giuseppe Talotta; Giuseppe Oliva; Filippo Laganà; Laura Manin; Antonino S. Fiorillo; Salvatore Andrea Pullano
- 15:15 Thermal Stress Analysis via Infrared Imaging for Safety Monitoring in Biomedical Electronic Devices**
Filippo Laganà; Danilo Praticò; Salvatore Calcagno; Domenico De Carlo; Fabio La Foresta; Giovanni Angiulli
- 15:30 Advanced NMR Lipidomic Profiling of Tomato Seed Oil for Biomedical Insight**
Laura Manin; Tatjana Antonic Jelic; Srecko Valic
- 15:45 Simple and Low-Cost HAR System for Recognizing and Monitoring Adults Movements Based on a Random Forest Classifier**
Salvatore Calcagno; Filippo Laganà; Danilo Praticò; Luigi Bibbo; Francesco Cotroneo; Mario Versaci; Giovanni Angiulli

15:00 - 16:00 *Aula R1 - PRABB - Via Álvaro del Portillo, 21*
Session 6.2 - AI-Driven Wearable and Implantable Sensors and Instrumentation - PART II
Chair: Mohammad Rafiqul Haider, *University of Missouri, USA*

- 15:00 Integration of FEM-Guided Wearable Sensing and AI for Adaptive Upper Limb Rehabilitation Monitoring**
Filippo Laganà; Diego Pellicano; Danilo Praticò; Mariangela Arruzzo; Antonino S. Fiorillo; Salvatore Andrea Pullano
- 15:15 An Inkjet-Printed Nonlinear-Element-Based Graph Neural Network for Solubility Prediction**
Shahrin Akter; Syed Islam; Mohammad R Haider
- 15:30 On the Efficiency and Safety of a Textile VOC Sensor for Breath Analysis**
Silvia Casalnuovo; Daniela Caschera; Simone Quaranta; Francesca Tombolini; Riccardo Ferrante; Fabio Boccuni; Francesca Sebastiani; Claudio Natale; Caputo Domenico
- 15:45 From CNN to SNN: Leveraging Neural Processing Units for Skin Lesion Classification**
Alberto Arciello; Massimo Merenda

16:00 - 16:30 *PRABB - Via Álvaro del Portillo, 21*
COFFEE BREAK

16:30 - 17:15 *Sala Conferenze - PRABB - Via Álvaro del Portillo, 21*

Session 7.1 - General Session - PART III

Chair: Giuseppe Ferri, *University of L'Aquila, Italy*

16:30 Two-Stages Two-Inputs DC-DC Boost Converter and Its DoE-Based Mathematical Model as Maritime Harvester

Giuseppe Ferri; Saleh El Hindi; Riccardo Olivieri; Paolo Esposito; Giulio Antonini

16:45 Development and Validation of an Accurate Eye Model for Capacitive Eye Tracking

Giulia Palmieri; Alberto Pettenella; Francesca Romana Costantini; Luca Merigo; Tommaso Ongarello; Marco Carminati

17:00 BMATRAG: a Locally Deployed Multimodal Privacy-Preserving RAG Framework with Novel Benchmark for Biomaterials

Naveen Gangadhara; Thiyaneeswar R; Swathi Sudhakar; Bala Natarajan; Babji Srinivasan

16:30 - 17:30 *Aula R1 - PRABB - Via Álvaro del Portillo, 21*

Session 7.2 - Optic and Electronic Sensors for Real-Time Physiological Monitoring - PART II

Chairs: Michele Riccio, *University of Naples Federico II, Italy*, Elena De Vita, *University of Naples "Parthenope", Italy*

16:30 Thermoelectric Energy Harvesting Modeling for Digital Twin of Human Body Wearable Sensors

Alessandro Massaro; Aime' Lay-Ekuakille; Alberto Bottino; Jacques Tene Koyazo

16:45 Integration of Microfluidics and Optical Fibers for Real-Time Viscosimetry: Towards a Practical Tool for Biomedical Studies

Anna Aliberti; Martino Giaquinto; Brunella Corrado; Andrea Cusano

17:00 A Graphene-Quantum-Dot Ink-Printed Dual-Mode Bending Sensor for Biomedical Applications

Dilruba Alam; Azmin Islam; Peifen Zhu; Syed Islam; Mohammad R Haider

17:15 Soccer-Players "Sportomics" Analysis for Future Injury-Prevention Biosensor Development

Anna Maria D'Ursi; Giuseppe Longo; Alfredo Rubino; Rosalba Liguori; Carmen Marino; Enza Napolitano; Manuela Grimaldi

17:30 - 18:00 *Sala Conferenze - PRABB - Via Álvaro del Portillo, 21*

CLOSING AND AWARD CEREMONY