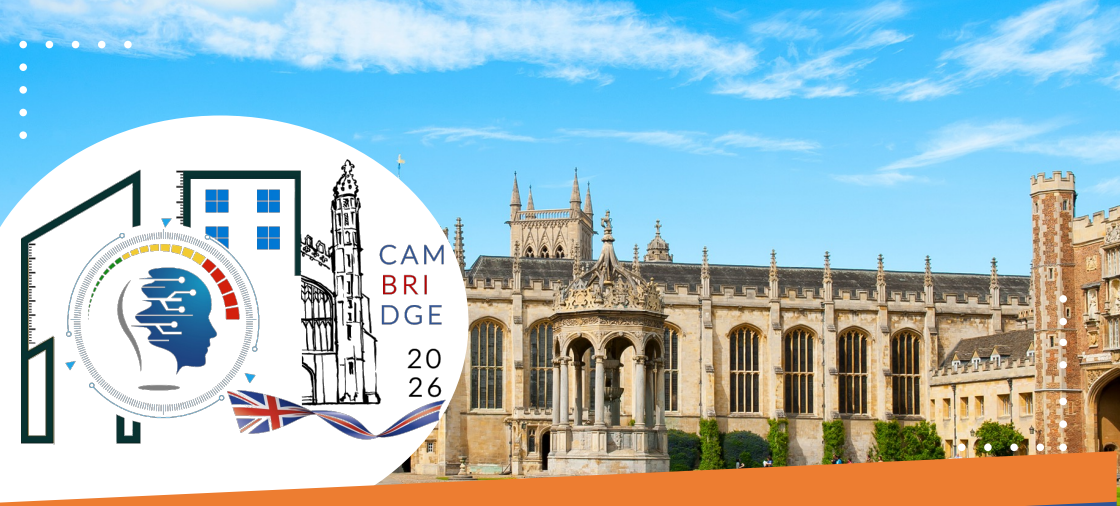

CONFERENCE PROGRAM

IEEE

IEEE INSTRUMENTATION & MEASUREMENT SOCIETY®

2026 IEEE INTERNATIONAL WORKSHOP ON

Metrology for Living Environment

UNIVERSITY OF CAMBRIDGE, UK

JULY 14 - 16, 2026

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Welcome Message from the General Chairs

On behalf of the Organizing Committee, it is our great pleasure to welcome you to the **2026 IEEE International Workshop on Metrology for Living Environment** (*MetroLivEnv 2026*).

MetroLivEnv 2026 aims to provide an active and stimulating forum in which academics, researchers, and industry professionals can meet, exchange ideas, and share recent advances in measurement science and data-processing techniques for structural health monitoring, comfort assessment, energy efficiency, Building Information Modelling (BIM), pollution monitoring, and innovative construction materials.

The Workshop gives particular attention, while not being limited to, emerging metrology-assisted solutions for the design, construction, and efficient, safe, comfortable, and healthy operation of the built environment, including applications in Active and Assisted Living (AAL). Such innovative solutions may rely on the Internet of Things (IoT), BIM, sensors, signal processing, data analytics, artificial intelligence, sensor networks, and interoperability standards.

The technical programme has been designed to attract a broad community of researchers, practitioners, and decision-makers working in metrology and related scientific fields. It presents cutting-edge scientific and technological solutions addressing the living environment throughout its entire life cycle, including design, energy efficiency, structural health monitoring, comfort assessment, indoor pollution, and the monitoring of chemical and physical parameters.

This fifth edition of MetroLivEnv is hosted by the University of Cambridge, United Kingdom, with the support of the University of Calabria, Università Politecnica delle Marche, eCampus University, the Department of Computer Science, Modelling, Electronics and Systems of the University of Calabria, the Department of Engineering and the Department of Health Sciences of the University of Basilicata, CNR-Nanotech, GMEE, GMMT, and several national and international research institutions.

We also wish to thank the sponsors that have provided financial support for the event: Alma Software, Red Yard, and Geomatics.

The conference venue is the Department of Computer Science and Technology of the University of Cambridge, historically known as the Cambridge Computer Laboratory. It is an internationally recognised centre for education, research, and innovation in computing. Located in the William Gates Building on the University's West Cambridge site, the Department provides a stimulating environment in which fundamental research and real-world technological applications are developed side by side.

Its activities span a broad range of areas, including artificial intelligence, machine learning, computer systems, robotics, cybersecurity, computer vision, human-computer interaction, programming languages, networks, and data science. Research within the Department also addresses major societal challenges through applications in healthcare, education, climate and sustainability, security, and intelligent human-centred technologies.

The Department has played an important role in the history of computing, contributing to developments that have influenced both academic research and everyday technology. Today, it continues to foster interdisciplinary collaboration among researchers, students, industry partners, and public institutions. Hosting IEEE MetroLivEnv 2026 in this setting provides an especially appropriate context for discussions on measurement, digital technologies, intelligent systems, and their role in improving living environments.

The MetroLivEnv 2026 Technical Programme consists of 75 oral presentations scheduled over three days. The presentations are organised into one General Session and sixteen Special Sessions. The Special Sessions provide focused opportunities for researchers to share knowledge, become acquainted with emerging research topics, exchange ideas, and establish new collaborations.

The submitted extended abstracts underwent a peer-review process. Relevance, quality, significance, and novelty were the principal criteria considered for acceptance and publication in the Workshop Proceedings. The Proceedings will be submitted for publication in the IEEE Xplore Digital Library and for indexing in Scopus. We sincerely thank all reviewers for their valuable contribution to the selection process and to the improvement of the presented works.

Technically extended versions of selected presented papers may be submitted to the following publication opportunities:

- Special Issue of the International Journal of Masonry Research and Innovation (IJMRI);
- Special Issue of Geomatics (MDPI);
- Thematic Issue of Acta IMEKO, the diamond open-access journal of the International Measurement Confederation.

MetroLivEnv 2026 is honoured to welcome distinguished experts in remote sensing, smart structures, and living environments as Invited Speakers.

- Prof. Giovanna Venuti, Politecnico di Milano, Italy, will open MetroLivEnv 2026 with the lecture entitled “Urban Heat Island and Thermal Comfort Assessment with Geomatics Techniques and Earth Observation Data: The Space It Up! Project”.
- Prof. Fabrizio Barone, University of Salerno, Italy, will open the second day of the Workshop with the lecture entitled “Methods and Techniques for Vibroacoustic Measurements in the Interpretation of the Living Environment”.
- Prof. Ioannis Brilakis, University of Cambridge, United Kingdom, will open the third day of the Workshop with the lecture entitled “Twin Systems”.

We are grateful to all Invited Speakers for joining the Workshop and for sharing their expertise with the MetroLivEnv community.

To recognise the most outstanding paper presented at the annual IEEE International Workshop on Metrology for Living Environment, the Best Conference Paper Award, sponsored by Alma Software, will be assigned. The Award is dedicated to the memory of Prof. Domenico Grimaldi, whose passion, enthusiasm, and commitment to science continue to inspire all recipients of this recognition.

Additional awards will be presented for the Best Paper by a Young Researcher and the Best Paper Presented by a Woman, recognising the important contribution of early-career researchers and the full engagement of women in all areas of metrology for living environments.

We sincerely thank all sponsors, patrons, supporting institutions, members of the Organizing Committee, Technical Programme Committee members, reviewers, authors, and participants whose commitment has made this event possible.

The 2026 IEEE International Workshop on Metrology for Living Environment is now ready to begin. We warmly welcome metrologists, mathematicians, biologists, physicists, chemists, psychologists, engineers, and all participants from related disciplines. We wish you a stimulating, fruitful, and enjoyable Workshop.

July 2026
Antonella Iuliano, *University of Basilicata, Italy*
Pietro Liò, *University of Cambridge, UK*
Francesco Lamonaca, *University of Calabria, Italy*
***MetroLivEnv 2026* General Chairs**

IEEE MetroLivEnv 2026 Committee

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Pasquale Daponte, University of Sannio, Italy

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Beniamino Murgante, University of Basilicata, Italy
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Francesco Felicetti, University of Calabria, Italy

Keynote Lecture - Tuesday July 14 - H 14:30

Urban Heat Island and thermal comfort assessment with geomatics techniques and Earth Observation data: the Space It Up! project

Giovanna **Venuti**
Politecnico di Milano, Italy

ABSTRACT

Within the framework of the "Space It Up!" project, funded by the Italian Space Agency (ASI) and the Ministry of University and Research (MUR), this work addresses the increasing impact of urban heat islands (UHI) in the context of more frequent, intense, and persistent heatwaves. The study focuses on urban and suburban environments, aiming to advance the understanding, monitoring, and modelling of urban thermal patterns and their driving factors.

A comprehensive analysis of heatwaves and thermal stress across Italy was carried out by combining very-high-resolution (2.2 km) climate reanalysis data (VHR-REA_IT) with long-term station observations over the 1981–2024 period. This multi-decadal dataset enables a robust assessment of spatial variability and long-term trends in extreme heat conditions.

To better resolve urban-scale processes, machine learning regression models were developed to predict near-surface air temperature by integrating in situ measurements—from both official and crowdsourced networks—with GIS and Earth Observation (EO) features. These models produce high-resolution temperature maps at different times of the day, capturing the diurnal evolution of the UHI effect.

In parallel, Local Climate Zones (LCZs) were mapped using hyperspectral PRISMA imagery, urban canopy parameter (UCP) datasets, and machine learning techniques. The workflow introduces improvements in the automation and quality control of training and validation samples, based on geometric properties, class balance, and UCP statistics, with data processing streamlined through Google Earth Engine and Python-based tools.

Finally, hyperspectral unmixing of PRISMA and DESIS data was employed to estimate the fractional composition of urban surface materials and investigate their relationship with land surface temperature derived from Landsat 8/9 thermal infrared observations. Validation

activities are currently ongoing using airborne hyperspectral and thermal data collected over Milan during the August 2025.

This study was carried out within the Space It Up project funded by the Italian Space Agency, ASI, and the Ministry of University and Research, MUR, under contract n. 2024-5-E.0 – CUP n. I53D24000060005.

SPEAKER BIOGRAPHY

Giovanna Venuti is Associate Professor of Geomatics at Politecnico di Milano, Department of Civil and Environmental Engineering, where she has been serving since 2015. She holds a PhD in Geodetic and Topographic Sciences from Politecnico di Milano and a MSc in Civil Engineering (summa cum laude) from Politecnico di Torino. Her research focuses on stochastic modelling of geodetic and environmental observations, with particular emphasis on satellite-based Earth observation and GNSS applications. Her main scientific contributions include satellite radar altimetry for sea surface estimation, gravity field modelling, GNSS-based atmospheric water vapour retrieval, and the use of opportunistic observations for meteorological applications such as convective rainfall prediction. In recent years, her research has expanded towards the integration of multi- and hyperspectral Earth Observation data for urban climate studies, including the analysis of the Urban Heat Island (UHI) phenomenon. She has extensive experience in national and international research projects, serving as Principal Investigator and Work Package Leader in several initiatives funded by the European Commission, ESA, ASI, and national programmes, including PRIN and PNRR projects. Recently she was Principal Investigator of a PRIN project ICREN on convective rainfall nowcasting and was involved in projects addressing urban climate and Earth observation, like the still ongoing Space It Up project funded by the Italian Space Agency and the Ministry of University and Research. At Politecnico di Milano, she teaches courses in geospatial data analysis, observation processing, and statistical methods, and she is a member of the PhD Board in Environmental and Infrastructure Engineering. She currently coordinates the MSc programme in Geoinformatics Engineering. She is co-author of more than 80 scientific publications in international journals and conference.

Keynote Lecture - Wednesday July 15 - H 10:10

Methods and Techniques for Vibroacoustic Measurements in the Interpretation of the Living Environment

Fabrizio **Barone**
University of Salerno, Italy

ABSTRACT

The living environment is a complex and dynamic system in which buildings, infrastructures, urban spaces, environmental conditions, and human activities continuously interact. Understanding these interactions requires integrated approaches that combine metrology, building science, environmental engineering, architecture, and human-centred design to assess environmental quality, comfort, health, and well-being.

Within this framework, vibroacoustic analysis offers a powerful measurement-based approach for investigating the behaviour of living environments. Sound and vibration phenomena emerge from the interaction between materials, structural systems, building services, transportation networks, environmental factors, and human presence. Their measurement and interpretation provide valuable information on building performance, structural integrity, environmental quality, energy efficiency, and occupant experience. Living environments can therefore be regarded as dynamic systems whose vibroacoustic responses reveal both physical conditions and patterns of use.

A central challenge is the development of interpretative models capable of linking objective measurements with human perception and environmental performance. Addressing this challenge requires advanced sensing technologies, intelligent monitoring systems, numerical simulations, digital twins, and data-driven analytical methods operating within a rigorous metrological framework. In this context, the integration of hard and soft metrology becomes essential, enabling measurable physical parameters to be correlated with indicators of comfort, well-being, and perceived environmental quality.

This keynote lecture presents current advances in methods and techniques for vibroacoustic measurement and characterisation of living environments. Particular attention is given to innovative sensing systems, computational modelling, and data analysis strategies that support the design, assessment, and management of sustainable, resilient, and human-centred

environments. The lecture highlights how vibroacoustic measurements can contribute not only to understanding environmental dynamics but also to improving the quality of life of those who inhabit them.

SPEAKER BIOGRAPHY

Professor Fabrizio Barone is Full Professor of Applied Physics at the Department of Medicine, Surgery and Dentistry "Scuola Medica Salernitana" of the University of Salerno, where he founded and directs the Applied Physics Research Group. Over more than thirty years of academic and scientific activity, he has developed an internationally recognised profile in applied physics, precision metrology, advanced sensing technologies, and the study of complex physical systems. His research output includes over 800 scientific publications and several international patents, reflecting significant contributions to both fundamental research and technological innovation.

Professor Barone has played leading roles in major international scientific collaborations, particularly within the VIRGO gravitational-wave detector project. He contributed to the scientific achievements that enabled the first direct detection of gravitational waves and the first observation of black holes. In recognition of these landmark discoveries, he shared the Special Breakthrough Prize in Fundamental Physics and the Gruber Cosmology Prize in 2016.

His current research focuses on innovative metrological approaches for investigating complex living environments through advanced sensing technologies, vibroacoustic measurements, environmental monitoring, and data-driven methodologies. By combining high-sensitivity instrumentation, measurement science, and computational modelling, he studies the interactions between physical systems, built environments, and human activities, supporting evidence-based strategies for sustainability, resilience, environmental quality, and human well-being.

In addition to his scientific contributions, Professor Barone has extensive experience in research governance, innovation management, and technology transfer. He serves as Rector's Delegate as President of the Patents Commission at the University of Salerno and is a member of IMEKO TC22 on Vibration Measurement, contributing to international activities in measurement science and metrological standardisation.

Keynote Lecture - Thursday July 16 - H 09:30

Twin Systems

Ioannis **Brilakis**
University of Cambridge, UK

ABSTRACT

Digital Twinning methods can produce a reliable digital record of the built environment and enable owners to reliably protect, monitor and maintain the condition of their asset. The built environment is comprised of large assets that need significant resource investments to design, construct, maintain and operate them. Improving productivity, i.e., efficiency and effectiveness, and creating new, disruptive ways to address existing problems throughout their lifecycle can generate significant performance improvements in cost, time, quality, safety, sustainability, and resilience metrics for all involved parties. Creating and maintaining an up-to-date electronic record of built environment assets in the form of rich Digital Twins can help generate such improvements. This talk introduces research conducted at the University of Cambridge on inexpensive AI methods for generating object-oriented infrastructure geometry, detecting, and mapping visible defects on the resulting Digital Twin, automatically extracting defect spatial measurements, and sensor and sensor data modelling. The results of these methods are further exploited through their application in design for manufacturing and assembly (DfMA), mixed-reality-enabled mobile inspection, and proactive asset protection from accidental damage.

SPEAKER BIOGRAPHY

Prof Ioannis Brilakis is the Laing O'Rourke Professor of Civil & Information Engineering and the Director of the Construction Information Technology Laboratory at the Division of Civil Engineering of the Department of Engineering at the University of Cambridge. He completed his PhD in Civil Engineering at the University of Illinois, Urbana Champaign in 2005. He then worked as an Assistant Professor at the Departments of Civil and Environmental Engineering, University of Michigan, Ann Arbor (2005-2008) and Georgia Institute of Technology, Atlanta (2008-2012) before moving to Cambridge in 2012 as a Laing O'Rourke Lecturer. He was promoted to Reader in October 2017 and to Professor in 2021. He has also held visiting posts at the Department of

Computer Science, Stanford University as a Visiting Associate Professor of Computer Vision (2014) at the Technical University of Munich as a Visiting Professor, Leverhulme International Fellow (2018-2019), and Hans Fischer Senior Fellow (2019-2023), and as a Visiting or Honorary Professor at Tsinghua, HKU, CityU, HKUST, BJUT, and many other universities in Asia (2024-2026). He is a recipient of the 2024 IAARC Tucker-Hasegawa Award, the 2022 EC3 Scherer Award, 2022 EC3 Thorpe Medal, 2019 ASCE J. James R. Croes Medal, the 2018 ASCE John O. Bickel Award, the 2013 ASCE Collingwood Prize, the 2012 Georgia Tech Outreach Award, a 2010 NSF CAREER award, and a 2009 ASCE Associate Editor Award. Dr Brilakis is an author of over 300 papers in peer-reviewed journals and conference proceedings, an Associate Editor of the ASCE Computing in Civil Engineering, ASCE Construction Engineering and Management, Elsevier Automation in Construction, and Elsevier Advanced Engineering Informatics Journals, the President of the International Association for Automation and Robotics in Construction, and the lead founder of the European Council on Computing in Construction.

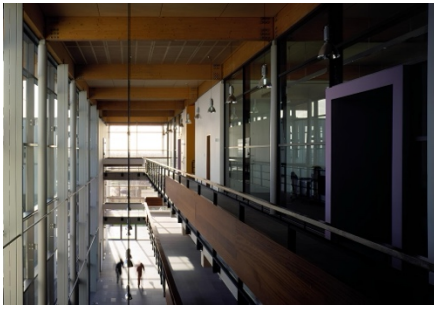
IEEE MetroLivEnv 2026 Venue

IEEE MetroLivEnv 2026 will be held at the **University of Cambridge** - Department of Computer Science and Technology - **William Gates Building**.

The William Gates Building is the home of the University of Cambridge's Department of Computer Science and Technology. This venue provides a unique opportunity to engage with the academic heart of Cambridge's renowned technology landscape.

ADDRESS

15 JJ Thomson Avenue
Cambridge - UK



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Program Schedule - Tuesday, July 14

TUESDAY - JULY 14, 2026		
14:00 - 14:30	Lecture Theatre 1 - Opening Ceremony - Welcome Addresses	
14:30 - 15:10	Lecture Theatre 1 - Keynote Lecture - Giovanna Venuti, Politecnico di Milano Urban Heat Island and thermal comfort assessment with geomatics techniques and Earth Observation data: the Space It Up! Project	
	Lecture Theatre 1	Lecture Theatre 2
15:15 - 16:30	S1.1 - Progress and innovations in mitigating natural and human-induced risks for the preservation of masonry and cultural heritage structures	S1.2 - Metrological approaches for the dual transition: leveraging sensing and digital technologies for comfort and efficiency in the built environment
16:30 - 16:50	COFFEE BREAK	
	Lecture Theatre 1	Lecture Theatre 2
16:50 - 17:50	S2.1 - Metrology applied to Innovative and Circular Construction materials in the Framework of the EU's Exploit4InnoMat Project	S2.2 - New non-intrusive IoT paradigms based on unconventional AI approaches for and by measurement systems and methods
17:50 - 18:30	Lecture Theatre 1 - Tutorial - Beniamino Murgante, University of Basilicata Climate Change and Urban Transformation: Computational Approaches for Sustainable Cities	
19:00	**Welcome Party** University of Cambridge - William Gates Building	

Program Schedule - Wednesday, July 15

WEDNESDAY - JULY 15, 2026		
	Lecture Theatre 1	Lecture Theatre 2
09:00 - 10:00	S3.1 - AI-Based Optimization and Multimodal Perception for Human-Robot Interaction in IoT-Enabled Smart Environments	S3.2 - Biostatistics, Machine Learning, and Metrology for Healthcare Living Environments
10:10 - 10:50	Lecture Theatre 1 - Keynote Lecture - Fabrizio Barone, University of Salerno, Italy Methods and Techniques for Vibroacoustic Measurements in the Interpretation of the Living Environment	
10:50 - 11:15	COFFEE BREAK	
11:15 - 12:30	S4.1 - Age-Friendly Living Environments: Adaptive Spaces, Multimodal Sensing, and Intelligent Technologies for Healthy Aging	S4.2 - Advanced Mathematical and mechanical models, experimental approaches and data analysis for Structural Health Monitoring (SHM) and Environmental Monitoring Systems - PART I
12:30 - 13:30	LUNCH	
	Lecture Theatre 1	Lecture Theatre 2
13:30 - 14:45	S5.1 - Advanced Mathematical Physics and Predictive Modeling for Urban Dynamics and Environmental Risk	S5.2 - Advanced Mathematical and mechanical models, experimental approaches and data analysis for Structural Health Monitoring (SHM) and Environmental Monitoring Systems - PART II
14:50 - 15:50	S6.1 - Artificial Intelligence and eXtended Reality for Smart Healthcare Metrology	S6.2 - Innovative Measures, Tools and Services for Climate-Resilient Buildings and Urban Systems - PART I
15:50 - 16:10	COFFEE BREAK	
16:10 - 16:50	Lecture Theatre 1 - Tutorial - Carmelo Scuro, University of Enna Kore, Italy Mathematical Modelling for Risk Mitigation: Designing Innovative Monitoring Systems for Infrastructure and the Environment	
	Lecture Theatre 1	Lecture Theatre 2
16:50 - 17:50	S7.1 - Graph Metrology, Bioinformatics, and AI for Precision Healthcare in Living Environments	S7.2 - Innovative Measures, Tools and Services for Climate-Resilient Buildings and Urban Systems - PART II
20:00	**Social Dinner** Clare Hall, Herschel Rd, Cambridge	

Program Schedule - Thursday, July 16

THURSDAY - JULY 16, 2026		
09:30 - 10:10	Lecture Theatre 1 - Keynote Lecture - Ioannis Brilakis, University of Cambridge, UK Twin Systems	
	Lecture Theatre 1	Lecture Theatre 2
10:15 - 11:15	S8.1 - High-Quality Building Data, AI-Based Services, and Measurement-Supported Digital Environments for Deep Renovation	S8.2 - From Measurement to Intelligence: Electrical Energy Monitoring and Automation in Smart Living and Hospitality Environments
11:15 - 11:40	COFFEE BREAK	
11:40 - 12:40	Lecture Theatre 1 - S9.1 - General Session	
12:40 - 13:10	Lecture Theatre 1 - Closing and Award Ceremony	
13:10 - 14:30	LUNCH	

Technical Program - Tuesday, July 14

13:00 - 18:00	*University of Cambridge - William Gates Building* **REGISTRATIONS**

14:00 - 14:30	*Lecture Theatre 1 - LT1* **OPENING CEREMONY - WELCOME ADDRESSES**

14:30 - 15:10	*Lecture Theatre 1 - LT1* **KEYNOTE LECTURE** **Chairs:** Pietro Liò, *University of Cambridge, UK* Francesco Lamonaca*, University of Calabria, Italy*

Urban Heat Island and thermal comfort assessment with geomatics techniques and Earth Observation data: the Space It Up! Project

Giovanna Venuti, *Politecnico di Milano, Italy*

15:15 - 16:30	*Lecture Theatre 1 - LT1* **S1.1 - Progress and innovations in mitigating natural and human-induced risks for the preservation of masonry and cultural heritage structures** **Chair:** Francesco Clementi, *Università Politecnica delle Marche, Italy*

15:15 **Simplified Ruled Explicit Meshing Procedure for the Pushdown Analysis of a Bare Arch Under Heyman Hypotheses**
Alessandro Gandolfi and Gabriele Milani (Politecnico di Milano, Italy)

15:30 **Integrated Structural Assessment and Conservation Strategy for the Church of Santa Maria di Piazza in Ostra Vetere (Italy)**
Francesco Monni, Francesco Clementi and Mattia Schiavoni (Università Politecnica Delle Marche, Italy)

15:45 **A Bond-Slip Approach for Cyclic Debonding Assessment of Composite-to-Substrate Interface**
Li Zhang (Politecnico di Milano, Italy); Ernesto Grande (University of Cassino and Southern Lazio, Italy); Gabriele Milani (Politecnico di Milano, Italy)

16:00 **Debonding Failure-Domains in Natural Textile Reinforced Mortar Systems**
Francesca Roscini (Niccolò Cusano University, Italy); Giulia Misseri (Università degli Studi di Firenze, Italy); Francesco Clementi (Università Politecnica Delle Marche, Italy)

16:15 **IoT Based Monitoring System for Cultural Heritage: The Case of the Roman Villa of Casignana**
Marco Antonio Mauro and Vincenzo Coniglio (Red Yard Research, Italy); Francesco Branca and Francesco Felicetti (University of Calabria, Italy); Antonio Francesco Gentile (Icar-Cnr, Italy); Domenico Luca Carnì (University of Calabria, Italy); Laura Fabbiano (Politecnico di Bari, University, Italy); Francesco Lamonaca (University of Calabria, Italy)

15:15 - 16:30 *Lecture Theatre 2 - LT2*
S1.2 - Metrological approaches for the dual transition: leveraging sensing and digital technologies for comfort and efficiency in the built environment
Chairs: Gloria Cosoli, *eCampus University, Italy*
Marco Arnesano, *eCampus University, Italy*

15:15 **A Sensing Platform for Personal Comfort Model Development and Application Based on Wearable and Environmental Sensors**
Dianel Ago (Callisia & eCampus University, Italy); Gloria Cosoli, Silvia Angela Mansi and Marco Arnesano (Università eCampus, Italy)

15:30 **Spatial Mapping of Thermal Comfort for Data-Driven Indoor Spaces Design**
Sara Meletani, Nicole Morresi, Vittoria Cipollone, Serena Serroni and Gian Marco Revel (Università Politecnica delle Marche, Italy)

15:45 **Metrological Framework for Low-Cost Multisensor Systems in Indoor Environmental Quality: Towards Reliable Sensing for Smart Living Environments**
Ramona Russo (Politecnico di Torino, Italy & Istituto Nazionale di Ricerca Metrologica, Italy); Alberto Bottacin, Michela Sega, Chiara Musacchio, Stefano Pavarelli, Andrea Prato, Alessandro Schiavi and Paola Iacomussi (Istituto Nazionale di Ricerca Metrologica, Italy); Anna Pellegrino and Giuseppina Arcamone (Politecnico di Torino, Italy); Francesca Rolle (Istituto Nazionale di Ricerca Metrologica, Italy); Fabio Favoino (Politecnico di Torino, Italy)

16:00 **Edge-Cloud Architecture for Sensor-Based Indoor Acoustic Monitoring in Buildings**
Alessandra Galassi, Chiara Marchionni, Marianna Rotilio (University of L'Aquila, Italy)

16:15 **Towards Privacy-Preserving Ladder-Walking Detection in Construction Environments Using Differential Privacy and Visual Data Protection**
Eftichia Badeka (Information Technologies Institute, Greece & CERTH, Greece); Ilias Koulalis and Konstantinos Ioannidis (Information Technologies Institute-CERTH, Greece); Stefanos Vrochidis (Information Technologies Institute (ITI), Greece)

16:30 - 16:50 *University of Cambridge - William Gates Building*
COFFEE BREAK

16:50 - 17:50	*Lecture Theatre 1 - LT1* **S2.1 - Metrology applied to Innovative and Circular Construction materials in the Framework of the EU's Exploit4InnoMat Project** **Chairs:** Maria Teresa Calcagni, *Università Politecnica delle Marche, Italy* Gian Marco Revel, *Università Politecnica delle Marche, Italy*

16:50 **Non-Destructive Investigation of Autoclaved Aerated Concrete by Shearography**
Chiara Saltarelli (CNR ISPC, Italy); Melania Paturzo, Gianluca Coda and Vito Pagliarulo (ISASI CNR, Italy)

17:05 **From Material Development to Real-Scale Monitoring: An Integrated Methodological Framework for Innovative Construction Materials**
Skaropoulou Aggeliki, Nikolaos Makris, Lampros Karalis and Maria Taxiarhou (National Technical University of Athens, Greece)

17:20 **Traceability and Uncertainty in Moisture Monitoring of Built/Urban Green Infrastructures: A Critical Scoping Review**
Laura Fabbiano (Politecnico di Bari, University, Italy); Francesco Lamonaca (University of Calabria, Italy); Rosario Morello (University Mediterranea of Reggio Calabria, Italy)

17:35 **A Methodological Framework for Integrated Metrology Services Within an Open Innovation Test Bed**
Maria Teresa Calcagni and Gian Marco Revel (Università Politecnica delle Marche, Italy)

16:50 - 17:50	*Lecture Theatre 2 - LT2* **S2.2 - New non-intrusive IoT paradigms based on unconventional AI approaches for and by measurement systems and methods** **Chairs:** Peppino Fazio, *Ca' Foscari University of Venice, Italy* Francesco Lamonaca, *University of Calabria, Italy*

16:50 **Scalable and Secure Edge Video Surveillance Without Cloud Dependency: An Open-Source, Forensic-Capable Architecture Based on Standard Protocols**
Antonio Francesco Gentile, Emilio Greco, Davide Macrì (ICAR CNR, Italy); Francesco Lamonaca (University of Calabria, Italy); Peppino Fazio (University Ca' Foscari of Venice - DSMN, Italy)

17:05 **Address Management for DCCS-Enabled DaaS-IoT Distributed Measurement Systems in Cultural Heritage Monitoring**
Peppino Fazio (University Ca' Foscari of Venice - DSMN, Italy); Lorenzo Grillo and Pierpaolo Sestito (Università della Campania Luigi Vanvitelli, Italy); Sebastiano Meduri (SebyOne S.r.L, Italy); Francesco Lamonaca (University of Calabria, Italy)

17:20 **Securing IoT and Wireless Sensor Network Communications: A Comprehensive Performance Analysis of Layer 2/3 Tunneling and VPN Technologies in Linux-Based Edge Computing**
Antonio Francesco Gentile, Emilio Greco and Davide Macrì (ICAR CNR, Italy); Peppino Fazio (University Ca' Foscari of Venice - DSMN, Italy)

17:35 **Spatial-Resolution Harmonization and Bias Decomposition of Open Global Climate Datasets over European Built-Up Areas: The Case of ERA5-Land and TerraClimate**
Alessandro Vitale and Francesco Lamonaca (University of Calabria, Italy); Enrico Borgogno Mondino (University of Torino, Italy)

17:50 - 18:30	*Lecture Theatre 1 - LT1* **TUTORIAL** **Chairs:** Antonella Iuliano, *University of Basilicata, Italy* Francesco Lamonaca*, University of Calabria, Italy*

Climate Change and Urban Transformation: Computational Approaches for Sustainable Cities

Beniamino Murgante, *University of Basilicata, Italy*

19:00	*University of Cambridge - William Gates Building* **WELCOME PARTY**

Technical Program - Wednesday, July 15

08:30 - 17:00	*University of Cambridge - William Gates Building* **REGISTRATIONS**

09:00 - 10:00	*Lecture Theatre 1 - LT1* **S3.1 - AI-Based Optimization and Multimodal Perception for Human-Robot Interaction in IoT-Enabled Smart Environments** **Chair:** Marianna Ruggieri, *University of Enna Kore, Italy*

09:00 **T-CPSOCB: Transformers-Based CPSO Optimised CatBoost for Multimodal Emotion Recognition**
Mario Collotta, Giuseppe Lorenzo Di Prima, Giovanni Giuseppe Iacuzzo, Angela Ricciardello and Marianna Ruggieri (University of Enna Kore, Italy)

09:15 **Reinforcement Learning-Driven Optimal UAV Selection Framework for Efficient UAV-to-UAV Communication**
Divyanshu Bhardwaj (Minix One, India); Angel Kanjia (Nirma University, India); Nilesh Kumar Jadav, Rajesh Gupta and Sudeep Tanwar (Marwadi University, India); Valerio Mario Salerno, Mario Collotta and Giovanni Pau (University of Enna Kore, Italy)

09:30 **Quantum-Secured Onion Routing with Federated Learning for 5G-Enabled Spaceborne IoT Networks**
Samiksha Gharmalkar and Bhavya Vora (Nirma University, India); Lakshin Pathak (Tatvic Digital Analytics, India); Rajesh Gupta, Nilesh Kumar Jadav and Sudeep Tanwar (Marwadi University, India); Fabio Arena, Mario Collotta and Giovanni Pau (University of Enna Kore, Italy)

09:45 **Evaluating Pre-Trained Audio Models for Activities of Daily Living Recognition**
Amani Arioui, Christophe Lohr and Mihai Andries (IMT Atlantique, France); Plinio Moreno (Instituto Superior Técnico, Portugal)

09:00 - 10:00	*Lecture Theatre 2 - LT2* **S3.2 - Biostatistics, Machine Learning, and Metrology for Healthcare Living Environments** **Chairs:** Antonella Iuliano, *University of Basilicata, Italy* Nicola Capece, *University of Basilicata, Italy*

09:00 **A Hybrid LSTM-AFT Approach for Environmental Nonconformity Prediction**
Maura Mecchi and Valerio Colonnese (University of Basilicata, Italy)

09:15 **A Measurement Method for the Evaluation of the Muscular Fatigue During Physical Exercise**
Francesco Felicetti, Simone Lanzino, Donato Ferrari, Simone Leone, Francesco Lago, Angelo Pellicori, Giuseppe Carbone and Francesco Lamonaca (University of Calabria, Italy)

09:30 **Modeling Heavy-Tailed Risks in Healthcare Environments: A Data-Driven Framework for Solvency Calibration**
Antonella Iuliano and Maura Mecchi (University of Basilicata, Italy); Alessandra Meoli (University of Salerno, Italy)

09:45 **Quantifying Semantic Stability in AI-Mediated Emotional Support Environments**
Donato Ferrari (University of Calabria, Italy); Antonella Iuliano (University of Basilicata, Italy); Francesco Felicetti (University of Calabria, Italy)

10:10 - 10:50 *Lecture Theatre 1 - LT1*
KEYNOTE LECTURE
Chairs: Pietro Liò, *University of Cambridge, UK*
Francesco Lamonaca, *University of Calabria, Italy*

Methods and Techniques for Vibroacoustic Measurements in the Interpretation of the Living Environment

Fabrizio Barone, *University of Salerno, Italy*

10:50 - 11:15 *University of Cambridge - William Gates Building*
COFFEE BREAK

11:15 - 12:30 *Lecture Theatre 1 - LT1*
S4.1 - Age-Friendly Living Environments: Adaptive Spaces, Multimodal Sensing, and Intelligent Technologies for Healthy Aging
Chair: Sara Casaccia, *Università Politecnica delle Marche, Italy*

11:15 **BCG Integration on a Smart Toilet: Performance Evaluation**
Ana Vieira and Pedro Correia (i3N, Portugal); Florinda Costa (University of Aveiro, Portugal); Antonio J. S. Teixeira (Universidade de Aveiro, Portugal); Ana Silva (University of Aveiro, Portugal); Cátia Leitão (I3N - University of Aveiro, Portugal)

11:30 **Sensorized Glove for Local Hand Temperature Monitoring and Smart Heating**
Graziella Scandurra, Riccardo Caponetto and Carmine Ciofi (University of Messina, Italy); Marco Pappalardo (Software engineering Italia, Italy)

11:45 **Statistical Characterization of Jerk Magnitude for Human Activity Recognition Using Wearable Sensors**
Gianluca Sartini, Sara Meletani, Sara Casaccia and Gian Marco Revel (Università Politecnica delle Marche, Italy)

12:00 **A Measurement Framework for Distinguishing Human Activities Using Time-Frequency Analysis of Ultrasonic Sensors Data**
Sara Meletani, Gianluca Sartini, Sara Casaccia and Gian Marco Revel (Università Politecnica delle Marche, Italy)

12:15 **CogAAL: A Privacy-Preserving, Full-Stack Cognitive Architecture Integrating Local VLMs, Heterogeneous Robotics, and IoT for Proactive Ambient Assisted Living**
Karameldeen Ibrahim Mohamed Omer (Politecnica Delle Marche, Italy & University of Khartoum, Sudan); Andrea Monteriù and Francesco Ferracuti (Università Politecnica delle Marche, Italy)

11:15 - 12:30 *Lecture Theatre 2 - LT2*
S4.2 - Advanced Mathematical and mechanical models, experimental approaches and data analysis for Structural Health Monitoring (SHM) and Environmental Monitoring Systems - PART I
Chairs: Salvador Ivorra, *University of Alicante, Spain*
Francesco Clementi, *Università Politecnica delle Marche, Italy*
Aguinaldo Fraddosio, *Politecnico di Bari, Italy*

11:15 **Splitting Tests for in Situ Evaluation of Apulian Tuff -Mortar Interface Behavior: Numerical and Experimental Approach**
Anna Castellano (Politecnico di Bari, Italy); Nataliia Pinchuk (Yuri Kondratyuk Poltava Polytechnic, Italy); Aguinaldo Fraddosio, Giuseppe Pompeo Demelio (Politecnico di Bari, Italy)

11:30 **Numerical Investigation of the Role of Clapping and Friction in Cracks on Sideband Peak Count-Index Results**
Luca Ferrulli, Anna Castellano and Aguinaldo Fraddosio (Politecnico di Bari, Italy)

11:45 **Image-Based Directional Characterization of Masonry Panels via Diagonal Compression Testing**
Alessandro Montanino (University of Florence, Italy & University of Alicante, Spain); Michele Betti (University of Florence, Italy); David Bru (University of Alicante, Spain); Luca Facchini and Mario Fagone (University of Florence, Italy); Salvador Ivorra Chorro (University of Alicante, Spain)

12:00 **Numerical Modeling of Mass Transfer Limitations in Coconut Shell Biochar for Nitrate Remediation in Cebu, Philippines**
Pierce Vincent Miranda, Adrich Ishi Keen Lawas, Feith L. Emeterio and Trisha Mae Ibarita (Cebu Institute of Technology - University, Philippines); Faith Marydull Capuno (Cebu Institute of Technology- University, Philippines); Cezanne L. De Asis and Jhomel Zaragoza (Cebu Institute of Technology - University, Philippines)

12:15 **Output-Only Dynamic Experimental Investigation of a Stand-Alone Trees**
Giacomo Zini, Gianni Bartoli and Michele Betti (University of Florence, Italy); Francesco Clementi (Università Politecnica delle Marche, Italy); Andrea Giachetti (University of Florence, Italy)

12:30 - 13:30 *University of Cambridge - William Gates Building*
LUNCH

13:30 - 14:45 *Lecture Theatre 1 - LT1*
S5.1 - Advanced Mathematical Physics and Predictive Modeling for Urban Dynamics and Environmental Risk
Chair: Angela Ricciardello, *University of Enna Kore, Italy*

13:30 **Predictive Modeling for Urban Dynamics**
Angela Ricciardello, Marianna Ruggieri, Carmelo Scuro (University of Enna Kore, Italy)

13:45 **Neural Networks for Solving a PDE-Based Wildfire Propagation Model**
Riccardo Scida, Giuseppe Alì and Francesco Lamonaca (University of Calabria, Italy); Carmelo Scuro (University of Enna Kore, Italy)

14:00 **Comparative Analysis of Finite Difference and Finite Element Methods for a Wildfire Spread Mathematical Model**
Giuseppe Alì (University of Calabria, Italy); Angela Ricciardello, Carmelo Scuro, Marianna Ruggieri (University of Enna Kore, Italy)

14:15 **GIS-Based Wildfire Risk Mapping in Tourist WUI Areas of Calabria**
Pierpaolo Antonio Fusaro (University of Calabria, Italy); Raffaele Mangiardi (Regione Calabria, Italy); Pascale Vacca (Universitat Politecnica de Catalunya, Spain); Pietro Pantano (University of Calabria, Italy); Elsa Pastor (Universitat Politecnica de Catalunya - Barcelona Tech, Spain); Francesco Demarco (University of Calabria, Italy)

14:30 **Zero-Shot Degradation Segmentation on Historical Buildings Using Vision LLM and SAM2**
Francesco Demarco, Pierpaolo Antonio Fusaro, Federico De Francesca, Pasquale De Nisi and Pietro Pantano (University of Calabria, Italy)

13:30 - 14:45 *Lecture Theatre 2 - LT2*
S5.2 - Advanced Mathematical and mechanical models, experimental approaches and data analysis for Structural Health Monitoring (SHM) and Environmental Monitoring Systems - PART II
Chairs: Salvador Ivorra, *University of Alicante, Spain*
Francesco Clementi, *Università Politecnica delle Marche, Italy*
Aguinaldo Fraddosio, *Politecnico di Bari, Italy*

13:30 **Denoising Autoencoder for Removing Noise from Radar Interferometric Signals on Historic Masonry Bridges**
Antonietta Varasano, Anna Castellano, Aguinaldo Fraddosio, Gregorio Andria and Mario Daniele Piccioni (Politecnico di Bari, Italy)

13:45 **From Terrestrial Laser Scanner Survey to Finite Element Modelling for the Dynamic Assessment of a Historic Masonry Tower: The Torre del Borgo Case Study**
Ramona Quattrini, Renato Angeloni, Chiara Mariotti, Mattia Schiavoni and Francesco Clementi (Università Politecnica delle Marche, Italy)

14:00 **Vibration-Based Damage Detection of Masonry Arch by Machine Learning**
Mariella Diaferio and Anna Castellano (Politecnico di Bari, Italy)

14:15 **Preliminary Assessment of a Low-Cost DeepTag-Based Vision System for Structural Dynamic Testing**
Sushant Chalise (Tribhuvan University, Nepal); Basanta Joshi (Institute of Engineering, Nepal); Francesco Picariello (Universitas Mercatorum, Italy); Eulalia Balestrieri and Michela Monaco (University of Sannio, Italy); Arman Neyestani and Mauro D'Arco (University of Naples Federico II, Italy)

14:30 **Estimating the Fundamental Frequency of Masonry Towers Through Experimental Data and Physics-Guided Predictive Models**
Francesca Roscini (Niccolò Cusano University, Italy); Giulia Misseri, Silvia Monchetti and Michele Betti (Università degli Studi di Firenze, Italy); Francesco Clementi (Università Politecnica delle Marche, Italy)

14:50 - 15:50 *Lecture Theatre 1 - LT1*
S6.1 - Artificial Intelligence and eXtended Reality for Smart Healthcare Metrology
Chairs: Nicola Capece, *University of Basilicata, Italy*
Maura Mecchi, *University of Basilicata, Italy*

14:50 **A Smart Device for Airborne Particulate Matter: An IoT Node to Improve the Quality of Life**
Fabio Leccese, Carlo Venettacci, Mariagrazia Leccisi, Federico Fina, Simone Bernardini and Giancarlo Della Ventura (Rome Tre University, Italy)

15:05 **Human-in-the-Loop AI, Distributed Sensing System, and LOLE.K Robotic Beds for Personalized Cardiac Rehabilitation: The ACCELERATE Study Protocol**
Giovanni Granata (Italy); Gloria Cosoli (Università eCampus, Italy); Antonio Luca Alfeo and Michele Bernardini (eCampus University, Italy); Buono Chiara (Italy); Nicola Ivan Giannoccaro (University of Salento, Italy); Maria Consiglia Calabrese (Azienda Ospedaliera Universitaria OO. RR. San Giovanni di Dio Ruggi, Italy); Vito Domenico Bruno (IRCCS, Italy); Giuseppe Tradigo (University Magna Graecia of Catanzaro, Italy); Ornella Piazza (University of Salerno, Italy); Gennaro Galasso (AOU San Giovanni di Dio e Ruggi d'Aragona, Italy)

15:20 **Wearable Sensors for Pediatrics: Evolution, Challenges, and Opportunities in Living Environments**
Gloria Cosoli (Università eCampus, Italy); Chiara Bencivenga (Sapienza University of Rome, Italy); Marco Arnesano and Federica Verdini (Università eCampus, Italy); Livio D'Alvia (Sapienza University of Rome, Italy)

15:35 **A Time-Series AI Framework for Predictive Risk Assessment from Heterogeneous Sensor Data**
Nicola Felice Capece, Gilda Manfredi and Ugo Erra (University of Basilicata, Italy); Marika Pia Salvato and Hiba Youssef (Sautech SRL, Italy)

14:50 - 15:50 *Lecture Theatre 2 - LT2*
S6.2 - Innovative Measures, Tools and Services for Climate-Resilient Buildings and Urban Systems - PART I
Chairs: Vittoria Cipollone, *Università Politecnica delle Marche, Italy*
Serena Serroni, *Università Politecnica delle Marche, Italy*
Celina Solari, *RINA CONSULTING S.P.A.*

14:50 **Immersive VR Training for Fire Safety and Evacuation in Indoor Office Environments**
Moatasim Mahmoud, Athos Papanikolaou and Stamatia Rizou (Singular Logic, Greece)

15:05 **Evaluating Heatwave Risks in Barcelona: A Quantitative MULTICLIMACT Method and Spatial CLIMRES Strategy**
Cristina Attanasio, Sabrina Febbraro and Florencia Victoria De Maio (RINA Consulting S.p.A., Italy); Iason C. Dimitriou, Apostolos Arsenopoulos and Alexandros Xenakis (National Technical University of Athens, Greece); Ruben Valsecchi, Celina Solari and Saimir Osmani (RINA Consulting S.p.A., Italy)

15:20 **Towards Climate-Resilient Buildings: A Statistical Analysis to Identify Crucial Comfort Measurement Parameters for Occupant Well-Being**
Nibras Abo Alzahab, Richard Kaculi and Gianluca Sartini (Università Politecnica delle Marche, Italy); Gloria Cosoli (Università eCampus, Italy); Rifat Seferi (LIS Live Information System, Italy); Mina Moayyedi (RWTH Aachen University, Germany); Rania Christoforou (Medical Faculty, RWTH Aachen University, Germany); Dianel Ago (Callisia & eCampus University, Italy); Marco Arnesano (Università eCampus, Italy); Marcel Schweiker (RWTH Aachen University, Germany); Gian Marco Revel (Università Politecnica delle Marche, Italy)

15:35 **Personalised Comfort Metrology: Measuring the Reliability of Augmented Thermal Sensation Vote Data**
Nibras Abo Alzahab, Richard Kaculi, Sara Casaccia, Serena Serroni and Gian Marco Revel (Università Politecnica delle Marche, Italy)

15:50 - 16:10	*University of Cambridge - William Gates Building* **COFFEE BREAK**

16:10 - 16:50	*Lecture Theatre 1 - LT1* **TUTORIAL** **Chairs:** Antonella Iuliano, *University of Basilicata, Italy* Francesco Lamonaca*, University of Calabria, Italy*

Mathematical Modelling for Risk Mitigation: Designing Innovative Monitoring Systems for Infrastructure and the Environment

Carmelo Scuro, *University of Enna Kore, Italy*

16:50 - 17:50	*Lecture Theatre 1 - LT1* **S7.1 - Graph Metrology, Bioinformatics, and AI for Precision Healthcare in Living Environments**

16:50 **Integrating AI into Time-Sensitive Clinical Workflows: A BPMN-Driven Case Study on Acute Stroke Care**
Alessandro Russo, Laura Cutrì, Salvatore Ammirato, Alberto Michele Felicetti and Domenico Conforti (University of Calabria, Italy)

17:05 **Overcoming Modality Scarcity in Parkinson's Diagnosis via Generative Geometric Deep Learning**
Emanuele Barbieri, Simone Monaco, Daniele Apiletti (Politecnico di Torino, Italy)

17:20 **Wearable Monitoring for Early Cardiotoxicity Detection in Cancer Patients: The COMPASS Vision**
Vincenzo Barbuto and Claudio Savaglio (University of Calabria, Italy); Ivy S. Curren (Helmholtz Zentrum München, Germany); Giovanna Liuzzo and Luigi Natale (Università Cattolica del Sacro Cuore, Italy); Saverio Gravina (Fondazione Policlinico Universitario A. Gemelli - IRCCS, Italy); Stephen J. Archibald (King's College London, United Kingdom); Raffaele Gravina (University of Calabria, Italy)

17:35 **Metrologically Grounded Graph-Augmented Multimodal AI for Surgical Video Documentation in Smart Healthcare Environments**
Cristian Cosentino, Fabrizio Marozzo, Francesco Felicetti and Francesco Lamonaca (University of Calabria, Italy); Pietro Lio (University of Cambridge, United Kingdom)

16:50 - 17:50 — *Lecture Theatre 2 - LT2*

S7.2 - Innovative Measures, Tools and Services for Climate-Resilient Buildings and Urban Systems - PART II

Chairs: Vittoria Cipollone, *Università Politecnica delle Marche, Italy*
Serena Serroni, *Università Politecnica delle Marche, Italy*
Celina Solari, *RINA CONSULTING S.P.A.*

16:50 **An Immersive Virtual Reality Serious Game for Preparing Citizens to Flood Emergencies in Urban Built Environments**
Gessica Sparvoli, Gabriele Bernardini and Leonardo Crescimbeni (Università Politecnica delle Marche, Italy); Simone Balducci and Alberto Bussaglia (Comune di Senigallia, Italy); Enrico Quagliarini and Serena Serroni (Università Politecnica delle Marche, Italy)

17:05 **Integrating Machine Learning and Smart Wayfinding Solutions for Riverine Flood Emergency and Evacuation Management in Urban Built Environments**
Alberto Bussaglia (Comune di Senigallia, Italy); Gabriele Bernardini, Matteo Postacchini and Serena Serroni (Università Politecnica delle Marche, Italy); Tijs Maes (Nazka Mapps, Belgium); Enrico Quagliarini (Università Politecnica delle Marche, Italy)

17:20 **Data-Driven Mean Radiant Temperature Measurement Using Ensemble Machine Learning: A Multi-Site Validation Study**
Edoardo Sulpizii, Vittoria Cipollone and Serena Serroni (Università Politecnica delle Marche, Italy); José L. Hernández and Juan Carlos Del Castillo Garcìa (Technology Centre Fundacion CARTIF, Spain); Gian Marco Revel (Università Politecnica delle Marche, Italy)

17:35 **Environmental Monitoring of the Santuario Della Beata Vergine Dei Miracoli Using a Self-Powered Hybrid System**
Carlo Trigona, Giuliano A. Salerno, Anna M Gueli, Rosaria Galvagno and Giuseppe Politi (University of Catania, Italy); Paola Fermo, Valeria Comite, Mattia Borelli and Andrea Bergomi (University of Milano, Italy)

20:00 — *Clare Hall - Herschel Road, Cambridge*

SOCIAL DINNER

Formal attire is recommended.

Technical Program - Thursday, July 16

09:00 - 12:00	*University of Cambridge - William Gates Building* **REGISTRATIONS**

09:30 - 10:10	*Lecture Theatre 1 - LT1* **KEYNOTE LECTURE** **Chairs:** Antonella Iuliano, *University of Basilicata, Italy* Pietro Liò, *University of Cambridge, UK*

Twin Systems

Ioannis Brilakis, *University of Cambridge, UK*

10:15 - 11:15	*Lecture Theatre 1 - LT1* **S8.1 - High-Quality Building Data, AI-Based Services, and Measurement-Supported Digital Environments for Deep Renovation** **Chairs:** Vittoria Cipollone, *Università Politecnica delle Marche, Italy* Serena Serroni, *Università Politecnica delle Marche, Italy* Vasilis Michalakopoulos, *National Technical University of Athens, Greece*

10:15 **LiveBetter: Accelerating Deep Renovation Through High-Quality Data and AI-Based Data-Driven Services**
Daniela Stoian and Vasilis Michalakopoulos (National Technical University of Athens, Greece); Elissaios Sarmas (EPU-NTUA, Greece); Efstathios Stamatopoulos, Michalis Rachmanidis and Vangelis Marinakis (National Technical University of Athens, Greece)

10:27 **Real-Time Residential Energy Monitoring via DSO API Integration: Data Characterization and Quality Enforcement**
Efstathios Alexandros Sarantinopoulos, Konstantinos Perifanos and Vasilis Michalakopoulos (National Technical University of Athens, Greece); Elissaios Sarmas (EPU-NTUA, Greece); Vangelis Marinakis (National Technical University of Athens, Greece); Zoi Mylona (HERON Energy SA, Greece); Athanasios Papakonstantinou (HERON Energy S.A., Greece)

10:39 **Indoor Comfort Measurement and User-Centered Dashboard for Real World Residential Applications: A Comfort-as-a-Service Framework**
Nibras Abo Alzahab, Vittoria Cipollone and Serena Serroni (Università Politecnica delle Marche, Italy); Blanca Larraz Sancho-Tello, Ana Sanchis Huertas and Miriam Navarro Escudero (Instituto Valenciano de la Edificación Fundación, Spain); Gian Marco Revel (Università Politecnica delle Marche, Italy)

10:51 **A Co-Creation Approach to User Requirements for Data-Driven Living Environment Services**
Adrienn Gelesz (ABUD Engineering Ltd, Hungary); Vittoria Cipollone (Università Politecnica Delle Marche, Italy); Julia Oravecz (ABUD Engineering Ltd, Hungary); Nibras Abo Alzahab (Università Politecnica Delle Marche, Italy); Daniela Stoian (National Technical University of Athens, Greece); Serena Serroni (MoS s.r.l, Italy); Andras Reith (ABUD Engineering Ltd, Hungary); Gian Marco Revel (Università Politecnica delle Marche, Italy); Vasilis Michalakopoulos (National Technical University of Athens, Greece)

11:03 **Towards Intelligent Digital Building Logbooks and Transparency of the Built Environment: AI, Semantic Knowledge, and Digital Twins for Structural Resilience**
Noemi Friedman (HUN-REN Institute for Comp. Science and Control, Hungary); Filippo Landi (University of Pisa, Italy); Petar Kochovski (University of Ljubljana, Slovenia); Bence Popovics (HUN-REN Institute for Comp. Science and Control, Hungary)

10:15 - 11:15 *Lecture Theatre 2 - LT2*
S8.2 - From Measurement to Intelligence: Electrical Energy Monitoring and Automation in Smart Living and Hospitality Environments
Chairs: Annalisa Liccardo, *University of Naples Federico II, Italy*
Domenico Luca Carnì, *University of Calabria, Italy*

10:15 **A Hybrid IoT Network for Residential Energy Monitoring in Augmented Reality Environments**
Annalisa Liccardo, Francesco Bonavolontà and Rosario Schiano Lo Moriello (University of Naples Federico II, Italy)

10:30 **Protecting Archaeological Heritage from Wildfire: Reaction-Diffusion Model at the Roman Villa of Casignana**
Francesco Felicetti, Donato Ferrari, Francesco Lamonaca, Cristian Granata and Tommaso Ruga (University of Calabria, Italy); Carmelo Scuro (Kore University of Enna, Italy); Luigi Teti (National Council of Research - Institution of Nanotechnology, Italy); Eugenio Vocaturo (CNR- Nanotec, Italy & University of Calabria, Italy); Ester Zumpano (University of Calabria, Italy)

10:45 **Design of a Low-Cost Embedded Measurement System for Power Quality Event Detection and Classification**
Domenico Luca Carnì and Francesco Lamonaca (University of Calabria, Italy)

11:00 **A Dual-Station IoT Monitoring System for Assessing Indoor Air Quality Variations Induced by FDM 3D Printing in Non-Industrial Environments**
Giovanni Rianna, Alessandro Scognamiglio, Giorgio de Alteriis and Rosario Schiano Lo Moriello (University of Naples Federico II, Italy); Adelaide Marzano (Edinburgh Napier University, United Kingdom); Alessia Teresa Silvestri (Universitas Mercatorum, Italy)

11:15 - 11:40	*University of Cambridge - William Gates Building* **COFFEE BREAK**

11:40 - 12:40	*Lecture Theatre 1 - LT1* **S9.1 - General Session** **Chairs:** Francesco Lamonaca, *University of Calabria, Italy* Pietro Liò, *University of Cambridge, Italy*

11:40 **Comparative Numerical Modelling of Masonry Arches Using Simplified and High-Fidelity Interface Approaches**
Natalia Pingaro (Politecnico di Milano, Italy); Ali Güney Özcebe and Barbara Borzi (European Centre for Training and Research in Earthquake Engineering, Eucentre, Italy)

11:55 **A Low-Cost Portable SpectroPhotometer Based on Hamamatsu C12880MA for Interior Design Applications**
Federico Fina, Mariagrazia Leccisi and Fabio Leccese (Roma Tre University, Italy)

12:10 **Safety in Construction Sites: BIM 4D Simulations for Automated Risk Assessment**
Enrico Pasquale Zitiello, Francesca Porcellini, Antonio Salzano and Maurizio Nicolella (University of Naples Federico II, Italy)

12:25 **Mathematical Modelling for Risk Mitigation: Designing Innovative Monitoring Systems for Infrastructure and the Environment**
Carmelo Scuro (Kore University of Enna, Italy)

12:40 - 13:10	*Lecture Theatre 1 - LT1* **CLOSING AND AWARD CEREMONY**

13:10 - 14:30	*University of Cambridge - William Gates Building* **LUNCH**