Keynote Speaker Bio

Filippo Ubertini

University of Perugia, Italy

filippo.ubertini@unipg.it

Filippo Ubertini is a Professor of Structural Design at the University of Perugia, where he coordinates the International PhD Program in Civil and Environmental Engineering. He graduated cum laude in Civil Engineering from the University of Perugia in 2005 and obtained his PhD from the University of Pavia in 2009. In 2008, he was a visiting scholar at Columbia University. He is the Head of SHMLab at UNIPG (www.shmlab.eu) and has authored over 170 papers in high-impact international journals. His research focuses on SHM, emphasizing physics-based methods and AI. Prof. Ubertini serves on the editorial board of MSSP and other international journals and is Vice-President of FABRE Consortium (www.consorziofabre.it/en). He has been PI of several research projects, including an ongoing FIS 2021 Advanced Grant (www.smssafest-fis.com). He has delivered plenary/keynote lectures at prestigious conferences, including SPIE-NDE 2025, IOMAC 2024, SPIE-NDE 2024, CMMOST 2023, TEST&E 2022, Eurodyn 2020, and CBPAT 2020. Dr. Ubertini is ranked #2 in Structural Engineering in topitalianscientists.org list. His contributions have been recognized with several awards, including ANIV 2010 Award and best paper awards at EVACES 2011, IOMAC 2019 and EUROSTRUCT 2023.

Keynote Title:

Advancing SHM: Leveraging AI-Driven Algorithms to Integrate Multimodal Sensor Data, Models, and Structures at a Territorial Scale

Advancements in AI and sensing technologies are transforming structural health monitoring (SHM), a crucial tool for maintaining aging infrastructure and cultural heritage structures. Despite progress in AI-driven analysis and self-sensing materials, effective prognosis in civil engineering remains challenging due to the gap between data-driven insights and physics-based models. To enable risk-informed decision-making on a larger scale, SHM must evolve into a multi-scale framework that integrates diverse sensor data with computational modeling, shifting from individual structures to interconnected networks. This talk explores cutting-edge SHM research, focusing on the integration of advanced sensing, AI analytics, and computational models. Key topics include self-sensing materials for smart masonry, deep learning and statistical pattern recognition for damage classification, and metamodeling with Bayesian inference for improved structural assessment. These innovations pave the way for smarter, data-driven infrastructure and built heritage management.