

Scientific Biography

Dr. Luigi Bibbò is a researcher at the Mediterranean University of Reggio Calabria, Italy, where he focuses on Big Data analytics, artificial intelligence, predictive modeling, and climate change adaptation strategies. His multidisciplinary research combines advanced engineering methodologies with data-driven approaches to address challenges in healthcare, environmental monitoring, robotics, and sustainable territorial development.

He received his Ph.D. in Electronic Engineering and Computer Science from the Second University of Naples in 2015, where his doctoral research concentrated on the development of innovative sensors based on plasmonic resonance in polymer optical fibers and photonic crystals. He earned both his Bachelor's and Master's Degrees in Biomedical Engineering from the University of Naples Federico II, specializing in advanced biomedical technologies and sensor development.

Throughout his career, Dr. Bibbò has gained extensive international research experience. He was a Visiting Scientist at Tufts University (USA), working in the Ultrafast Nonlinear Optics and Photonics Laboratory on hybrid plasmonic-photonic crystal sensors. He later served as a postdoctoral researcher at Shenzhen University (China), conducting research on plasmonic metamaterials, metasurfaces, and orbital angular momentum (OAM) beam generation. He also collaborated with the Nanophotonic Research Center on advanced optical communication technologies.

From 2019 to 2022, he was a Researcher at the Mediterranean University of Reggio Calabria, leading research activities on intelligent monitoring and localization systems for elderly assistance. Subsequently, he joined the University of Florence, contributing to the European PHARAON Project, where he worked on the design and validation of robotics, Internet of Things (IoT), and Artificial Intelligence technologies for biomedical applications. Since 2024, he has been involved in research activities within the TECH4YOU program, focusing on forecasting systems and AI-driven solutions for climate resilience and territorial transformation monitoring.

His research interests encompass sensors, photonics, optical fibers, metamaterials, nanotechnology, artificial intelligence, machine learning, deep learning, robotics, exoskeletons, virtual and augmented reality, GIS, remote sensing, and predictive analytics. In recent years, he has developed advanced AI-based models, including Random Forest and deep neural network architectures, for applications in environmental risk assessment, climate change adaptation, biomedical engineering, and human-centered technologies.

Dr. Bibbò is the author of numerous international scientific publications and serves as a reviewer for several leading journals in engineering, optics, nanotechnology, robotics, and artificial intelligence, including *IEEE Access*, *Nanotechnology*, *Optical Materials Express*, *Journal of Optics*, *Sensors*, and *Frontiers*. He has also served as **Guest Editor** for special issues dedicated to healthcare technologies, Human Activity Recognition, Robotics, IoT, and AI-driven bioengineering solutions. He is a **Fellow of the Engineering Research Council (FERC)** and actively contributes to the international scientific community through editorial activities, conference participation, and collaborative research initiatives.

Through his interdisciplinary approach, Dr. Bibbò continues to advance innovative solutions that integrate engineering, artificial intelligence, and data science to improve healthcare systems, assistive robotics, environmental sustainability, and smart territorial management.