

Research Fellow at the University of Bologna, he carries out research in the field of advanced composite materials, with particular focus on the development of multifunctional materials and self-sensing systems for applications in mechanical engineering and structural health monitoring.

His research interests are particularly focused on the design, manufacturing, and characterization of sensorized composite laminates obtained through the interleaving of piezoelectric nanofibers, on the study of the electromechanical behavior of innovative composite materials, and on the optimization of manufacturing processes through advanced statistical methodologies. His current research is focused on the development of self-sensing composite laminates based exclusively on CFRP and piezoelectric nanofibers, capable of integrating sensing functionality with enhanced mechanical performance.

Education

He obtained his Master's Degree in Mechanical Engineering from the University of Bologna in 2022, with a thesis on the development and modeling of a self-sensing composite laminate interleaved with piezoelectric nanofibers and Cu-CFRP electrodes. He also attended professional training courses in mechanical design for additive manufacturing and industrial project management.

Academic Career

After completing his Master's Degree, in 2022 he worked as a research fellow at the Interdepartmental Centre for Industrial Research in Advanced Mechanics and Materials (CIRI MAM) of the University of Bologna, where he focused on the study, development, and characterization of polymeric nanofiber bundles.

Since March 2026, he has held a PhD in Industrial Mechanical Engineering and Advanced Engineering Sciences at the Department of Industrial Mechanical Engineering and Advanced Engineering Sciences (DIMSAI), University of Bologna, with a research project devoted to the study and development of self-sensing composite materials. As part of his research activities, he collaborates with national and international multidisciplinary research groups in the field of advanced composite materials, nanofibers, and integrated sensors.

Teaching Activities

Since 2024, he has been a teaching tutor for the Master's course "Laboratorio di Materiali Compositi" at the University of Bologna. He has also co-supervised Master's degree theses in the field of composite materials engineering and integrated sensing systems.

Scientific Activity

His scientific activity focuses on the development of multifunctional and self-sensing composite laminates through the use of piezoelectric and polymeric nanofibers produced by electrospinning. During his research career, he has contributed to the development of self-sensing sensors based on piezoelectric nanofibers, as well as to the realization of composite materials capable of integrating structural health monitoring functions without the introduction of extraneous materials into the laminate.

His research also includes the study of the toughening effects induced by the interleaving of rubbery nanofibers in CFRP laminates, also as a function of temperature and of the amount of nanofibrous material introduced. He applies Design of Experiment and Response Surface Methodology techniques to optimize manufacturing parameters, in addition to validating equivalent circuit models for the analysis of the piezoelectric behavior of the developed laminates.

He is the author and co-author of scientific publications in international journals in the field of composite materials, integrated sensors, and multifunctional materials.

International Experience and Research Projects

In 2025, he carried out a research period as a Visiting PhD Researcher at Empa – Swiss Federal Laboratories for Materials Science and Technology in Dübendorf, Switzerland, within the Smart Processing for Ceramics and Sensor-Composite Materials group, where he worked on the design of self-sensing composite materials based on piezoceramic nanofibers.

He also participated in the PRIN 2022 – SELF-RE-PREG – Self-Sensing Interleaving for Recycled Prepreg project, coordinated by the Politecnico di Milano, contributing as a PhD Researcher to the development of composite materials based on recycled prepreg and sensorized through the interleaving of piezoelectric nanofibers.