SHORT BIO:

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2003- 2005 Ph.D. in “Machine Design” University of Modena and Reggio Emilia, Italy
1998-2002: Master Degree in Mechanical Engineering, University of Modena and Reggio Emilia, Italy

The main research activities carried out include:
- analysis, design and optimization of mechanical components and 3D metamaterials
shrink fit to maximize the transmitted torque, stress concentration in components with periodic notches using the thermal analogy method, fatigue resistance prediction in notched components using critical distance theory and stress gradient; three-dimensional metamaterials for innovative biomechanical structures obtained by 3D printing (4 patents have been filed in this area)
- bonded structural joints and polymeric materials
study of simple, portable and accurate numerical methods for the design of bonded structural joints; static characterization of epoxy and anaerobic adhesives, both in the elastic and post-elastic fields, with the aim of identifying their constitutive bond and failure criteria; fatigue characterization of anaerobic adhesives; study of thermo-mechanical problems in elastomeric components, such as the polyurethane coating of wheels for industrial trucks; study of physical-mechanical degradation problems in polymeric components, such as polyethylene pipes for the transport of drinking water
- structures for environmental energy recovery, smart materials, micro/nano actuation
design and validation of simple and efficient structures (low frequency, multifrequency), for the conversion of environmental kinetic energy into electrical energy (energy harvesting) both by piezoelectric transducers and by electromagnetic transduction; development, characterization and application of piezoelectric elastomers; pull-in problems on micro and nano actuators: experimental validation of analytical models (in collaboration with colleagues from Construction Science)