

CIVIL AND ENVIRONMENTAL ENGINEERING

CRT/DISEG - Sustainable Technologies for Resilient Operations of Next-Generation infrastructures

Funded By	FONDAZIONE CRT CASSA DI RISPARMIO DI TORINO [Piva/CF:06655250014] Dipartimento DISEG
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Context of the research activity	The objectives of the research activity, to be carried out by the PhD student, are the following: • Development of new tools to be implemented on civil infrastructures; such contactless strategies will be tested on board of UAVs.
Objectives	Governments and local authorities must conduct resilience analyses to assess the level of safety of their infrastructures against natural and manmade hazards. For large-scale resilience simulations, meticulous input data is of paramount importance, as it enables the rigorous testing of various emergency scenarios. Structural Health Monitoring (SHM) can play a pivotal role in resilience by providing real-time data about the actual condition of structures and infrastructures. The objective of this research activity is to develop methodologies and technical solutions for monitoring and enhancing the resilience of communities using contactless methods as well. It primarily focuses on establishing inspection programs for structures and infrastructure, incorporating real-time, remotely operated, and automated SHM monitoring systems. Additionally, innovative tools will be used to evaluate the local and global fragilities of structures caused by aging, degradation, events, and other natural and anthropic susceptibility factors. Several applications to both new, existing and historical buildings are envisioned during the PhD program. The acquired data will be embedded in large scale FE models for the resilience simulations.
Skills and competencies for the development of the activity	Experience in coding with MATLAB and Python. Good knowledge of Operational Modal Analysis techniques. Skilled in Finite Element software including ANSYS, MIDAS, etc. Strong problem solving technique. Background in ML algorithms.