PhD in Civil and Environmental Engineering

Research Title: Resilience-Based design of buildings under multiple hazards

Funded by	Politecnico di Torino (Joint Research Projects with Top Universities)

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Context of the research activity	Urban societies depend on their infrastructures (e.g. power, transportation, water network, etc.), which are interdependent. This dependency, and the infrastructure interdependencies are more evident during disasters when "cascade effects" occur. The rising of global population and the massive economic development in areas prone to disasters have increased the chance of catastrophic incidents. Latest disasters have also shown that large parts of the world are subjected to multiple natural and manmade hazards. Modern societies are trying to enhance their capacity to withstand and to minimize the impact of multiple hazard on community infrastructure and human beings. Therefore, multi-hazard resilience engineering is needed more than ever before.

Objectives	The PhD dissertation will focus on the resilience-based design (RBD) of buildings and infrastructures modeled in a virtual-city subjected to multiple hazards. The structural seismic responses of the buildings in the virtual-city are assessed by appropriate finite element (FE) models. Several methodologies are available in literature to evaluate resilience, but only few of them are feasible in an engineering design setting. The project's goal is developing different applications which show the feasibility of a methodology to evaluate and design structures and infrastructures which are resilient against several types of hazards. Both scenario based and probabilistic approaches will be investigated.

Skills and competencies for the development of the activity	• Good knowledge of English. • Preferably MS degree in civil or Building Engineering