

1. **Research activity**

My research project, entitled “*Developing and testing of a data-driven method for geological multi-hazard assessment*”, is founded by CERI research center of SAPIENZA University of Rome.

It aims to contribute to an in-depth assessment of multiple risks in urban areas, in order to achieve a dynamic understanding of disaster risk around us and making disaster less disastrous turning data into decisions to improve the resilience of our cities.

Specifically, the goal is to develop an innovative model based on data-fusion and machine learning algorithms which leverages on the joint use of open-source geospatial databases to assess multiple geological hazards. Therefore, it will be essential to explore existing DBs relating to potential hazardous phenomena, and then combine and cross-validate them in order to extract as much information as possible useful for the hazard analysis. Merging all the DBs of both inventory and hazard levels and identifying correlations and differences between the data will lead to a unique multi-hazard zonation map.

The hazard analysis will be carried out in a pilot major city as well as mountain countries. The idea is to use the metropolitan city of Rome and the central Apennine countries affected by the 2016-2017 seismic sequence as experimental sites.

The main steps of this PhD project can be summarized as follows:

1. Pilot sites DBs collection and preparation;
2. Data-driven algorithms evaluation;
3. Definition of the methodological approach;
4. Building and training the assessment model;
5. Assessing multiple hazard in the pilot areas;
6. Evaluating model accuracy in different test sites.

Such model, able to combine open-source geospatial DBs to the assessment of multiple hazard interacting with human activities, will be able to support asset managers in predictive maintenance and sustainable development as well as insurance companies.