



# RESISK

research-sustainable-risk



**Research Engineering for  
Sustainable Risk Solutions**



# Build a sustainable and safer future





## A UNIVERSITY SPIN-OFF

RESISK is a spin-off company of IUSS Pavia - a higher-level University School in Italy offering post-graduate excellence Master and PhD programmes.

IUSS Pavia hosts the ROSE School, internationally recognised in the earthquake engineering field, and pioneer in the doctoral programmes on climate change in Italy.

**The perfect fertile ground for the creation of RESISK.**

## WHO WE ARE

**RESISK** represents an innovative and multidisciplinary business concept that combines applied research and solid know-how, through software development and decision support for individual owners, SMEs, insurance groups, non-governmental organisations (NGOs) and other stakeholders.

*“Research is meaningful when actually connected to the real world, transferring the know-how acquired in the academic environment”*

# FOUNDERS



**Mattia Calò**



**Ricardo Monteiro**



**Gianrocco Mucedero**



**Nicola Scattarreggia**

## VISION

*“Achieving your goals with a proper awareness of risk”*

## THE TEAM

The **RESISK** team has multidisciplinary skills. We work together, in synergy, tackling challenges with innovative approaches.

We are a focused team, developing ad hoc solutions for you to achieve your goals.

# SERVICES

## Risk Assessment

Innovative solutions for the quantification of risk metrics for natural and human-induced events.

## Decision-making Support

Algorithms to support strategic decision-making, while optimising processes and guiding stakeholders towards success.

## Post damage & reconstruction

Build Back Better, Multi-Criteria Decision Making and Resilience-Based approaches to turn challenges into sustainable growth opportunities.

## Engineering Consultancy

Advanced modelling and performance assessment of both regular and complex structures, also from a life-cycle perspective.

## Software Development

Software and tools for structural and earthquake engineering problems.

# MISSION

*Provide professional services, methodologies and tools with high added value, transferring multidisciplinary skills and know-how acquired in academia.*



Transfer of academic know-how to industry for a better, safer and more sustainable future.



Ad hoc procedures and advanced methodological tools to support decision-making and operational processes.



High quality standards guaranteed by a highly qualified team that provides services.



Offering the latest research developments in the field of structural and risk engineering.

# RISK ASSESSMENT

Risk assessment and catastrophe damage quantification for single and multiple assets at different territorial levels (provincial, regional, national).

## More specifically:

- Fragility curves and damage models for classes of buildings and infrastructure and industrial components
- Large-scale analysis and quantification of multiple risk metrics (economic losses, loss of human lives, business interruption, etc.)
- Risk assessment for multiple hazards with a particular focus on indirect economic losses and social repercussions
- Support for stakeholders, insurance and reinsurance companies for the definition of ad-hoc insurance products/packages and insurance-linked securities
- Evaluation of mitigation strategies and identification of strategic financial plans



A wide range of specialised approaches, techniques, information systems and software, set to turn complex data in informed decisions, optimise processes and procedures, and guide stakeholders towards success.

## More specifically:

- ❑ Prioritisation of seismic and energy retrofitting strategies for single buildings or portfolios of buildings employing Multi-Criteria Decision Making (MCDM) approaches.
- ❑ Support in prioritising detailed analysis, monitoring, or retrofitting interventions in infrastructure portfolios, including aspects of maintenance and network usability.
- ❑ Quantification of thresholds for calibration of early warning systems to quickly suspend different types of activities and protect human lives.



## POST DAMAGE & RECONSTRUCTION

A reconstruction challenge can be turned into an opportunity of regrowth adopting sustainability principles that are focused on post-event reconstruction:

- ❑ Approaches based on Build Back Better, Multi-Criteria Decision Making, and Resilience principles to support the definition of strategic reconstruction plans, allocating the available economic resources in an optimised manner and increasing community resilience.
- ❑ Platforms and web-tools to quickly collect and store damage data from Rapid Visual Screening to define simplified vulnerability indices based on pre- and post-damage and ageing conditions of structural and non-structural elements of existing structures.
- ❑ Prioritisation of structure and infrastructure reconstruction needs and stages, considering multiple decision variables, of technical-engineering, cultural and socio-economic nature.



- Conceptual design of structure and infrastructure with particular focus on economic losses and environmental impact.
- Analysis and assessment of the performance of non-structural elements, steel storage racks and tanks.
- Design of retrofitting interventions for structure and infrastructure to ordinary and exceptional/extreme loads/hazards (e.g., earthquakes, windstorms, progressive collapse).
- Numerical estimation of structural robustness.

## As well as...

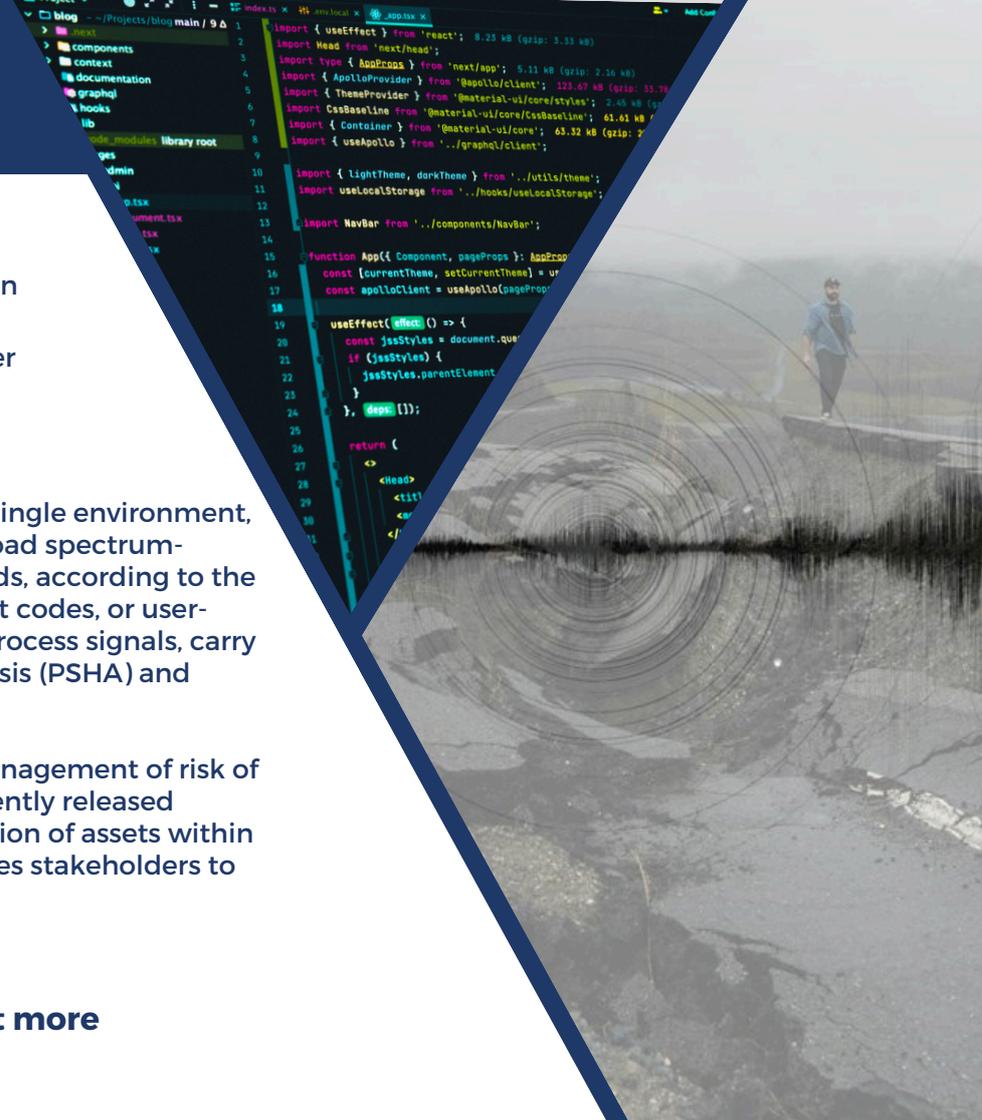
- Detailed structural response modelling using state-of-the-art approaches and software.
- Numerical analysis of different computational demand and complexity levels: linear and nonlinear (static and dynamic).
- Static and dynamic vulnerability checks of new and existing structure and infrastructure.



The developed software tools are based on continuous research innovation. Ad-hoc and cutting-edge products to offer unique solutions.

- Innovative web application that, in a single environment, allows one to select, scale and download spectrum-compatible real ground motion records, according to the most common design and assessment codes, or user-defined spectra, as well as filter and process signals, carry out probabilistic seismic hazard analysis (PSHA) and disaggregation analysis.
- Web tool for the classification and management of risk of existing bridges, according to the recently released Italian guidelines, as well as prioritisation of assets within large bridge portfolios. The tool enables stakeholders to carry out proactive risk management.

**Contact us to find out more**





Have a look at the Research & Development section  
for the portfolio of recent projects and to stay  
updated on the latest initiatives by RESISK

**RESISK**  
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## Contact Us



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