Structural engineer/Vulnerability modeller

for the development of vulnerability and fragility models at global scale

The Global Earthquake Model (GEM) is a global collaborative effort that brings together state-of-the-art science, national, regional, and international organisations and individuals aimed at the development of open tools, datasets and best practice for calculating and communicating earthquake hazard and risk worldwide.

GEM is leading an initiative to derive sets of fragility and vulnerability functions at a global scale for regional risk analysis, covering several risk metrics (e.g., economic losses, buildings lost, human losses, injuries, population displaced, business interruption). Within this initiative, sets of ground motion records compatible with the seismicity and tectonic region in various parts of the world are being selected, numerical model for the most common types of constructions is being developed, and nonlinear time history analysis will be performed using GEM's Vulnerability Modellers Toolkit. These activities will result in several fragility and vulnerability functions which will contribute to the on-going global risk modelling effort being led by GEM and its partners.

We are looking for a structural engineer/vulnerability modeller with expertise in one or more of the following disciplines: structural engineering, earthquake engineering and/or earthquake loss modelling. The modeller will join the GEM Secretariat science team in Pavia (Italy), but working remotely is also a possibility.

This position will have an initial period of 2 years, starting in August 2024, with the possibility to become a permanent position. The primary duties for this position are:

- Development of tools for the derivation of physical vulnerability and fragility models using analytical methodologies.
- Definition of capacity curves and back bone curves for idealized MDOF systems ("stick and mass" models).
- Derivation of fragility/vulnerability functions for the assessment of structural damage, economic losses, fatalities, injuries, business interruption and loss of embodied carbon.
- Development of functional recovery functions and damage-dependent fragility models.
- Collection of impact data for the purposes of verifying and calibrating existing fragility/vulnerability models.
- Application of methods and tools for the collection, processing, and selection of ground motion records for nonlinear time history analysis.
- Liaison with GEM partners and lead research projects and collaborations covering vulnerability assessment.

The ideal candidate has:

- Experience in development of fragility/vulnerability models;
- Experience in probabilistic and deterministic seismic hazard and risk assessment;
- Strong background in statistics and reliability;
- Knowledge of some scientific programming languages (e.g. Python);
- Proven ability to work in a multidisciplinary team;
- Good oral and written communication skills;
- Availability to travel around the world;
- Passion for a humanitarian mission to reduce loss of lives and livelihoods due to earthquakes.

English is the working language at GEM; the knowledge of second language can be a plus, but not required.
We look forward to hearing from you. Please apply to vitor.silva@globalquakemodel.org with a cover letter/email explaining why you would be a good fit for the position, your resume/CV, and timeline of availability. The selection procedure will continue until we have found a suitable candidate.