

PhD or Post-doctoral Researcher Position at the National Technical University of Athens:

HIGH FIDELITY DIGITAL TWINS FOR MULTI-HAZARD DAMAGE AND RISK ASSESSMENT OF CULTURAL HERITAGE

Position overview

Climate change (CC) and extreme natural hazards are threatening our cultural heritage (CH). Coastal, underwater, urban and landscape CH structures can be exposed to (i) one or more types of extreme events, such as, hydrometeorological extremes and geophysical hazards, and (ii) gradual environmental stressors that cumulatively deteriorate the CH and amplify the risk for damage. The state-of-the-art solutions cannot always provide a holistic approach to deal with these effects. The recently funded multi-institutional Horizon Europe project **“TRIQUERTA: Toolbox for assessing and mitigating climate change risks and natural hazards threatening cultural heritage”** (<https://triquetra-project.eu/>), which is coordinated by the National Technical University of Athens (NTUA), aims to address the challenge of safeguarding and protecting Europe’s CH by advancing the fundamental understanding of the interaction of extreme water hazards and multi-hazard scenarios with the historic built environment, quantifying the potential impact on different types of structures and typologies, and discovering, implementing, evaluating and promoting innovative solutions.

The new researcher (PhD or Postdoc) will have a structural engineering background and will focus on (i) the prediction of the damage modes of different CH types under climate change-driven gradual and extreme water hazards (storm surge, inland floods), geophysical hazards (earthquakes, tsunamis) and multi-hazard scenarios, and (ii) the development of risk assessment methodologies and digital twins by integrating high-fidelity physics-based models with surrogate models and sensors. The researcher will join a multi-disciplinary team in the School of Civil Engineering at NTUA and will be supervised by Prof. C. Spyarakos and Dr. D. Istrati, while he/she will also collaborate with colleagues from the School of Rural and Surveying Engineering, the 21 European partners of the consortium that bring unique expertise in different areas, such as, geological risk assessment, flood risk management, remote sensing and the development of novel in-situ sensors.

Qualifications

- Strong background (MSc or PhD) in **structural engineering and computational modeling** with preferred expertise in Earthquake engineering, Computational mechanics and finite element modeling, Probabilistic methods and uncertainty quantification, Damage assessment of structures and soil-structure systems, Vulnerability and risk assessment methodologies, Development of digital twins
- Track record (e.g. thesis, research publications) in some of the aforementioned areas
- Problem-solving skills, strong technical writing and communication skills in English
- Motivation and ability to work well in multi-disciplinary research teams



Funded by
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Other information

Please send a CV and some evidence of your qualifications to Dr. Istrati (distrati@mail.ntua.gr) with the subject "*TR_DigitalTwins_Level*" (Level=PhD or Postdoc) before **September 24th, 2023** at 11:59PM CET.

Preferred starting date: Earliest possible (e.g. October).
Salary commensurate with experience and national standards.

The researcher will become part of the NTUA School of Civil Engineering, which is considered one of the top civil engineering schools in Europe and in 2022 was ranked 5th globally by the Shanghai ranking system (<https://www.shanghairanking.com/rankings/gras/2022/RS0211>) and in the top 50 by the QS ranking system (<https://www.topuniversities.com/university-rankings/university-subject-rankings/2023/civil-structural-engineering>)