Natural hazard risk management for cultural heritage assets: advances in the context of the RIACT research project

Xavier Romão, Rui Figueiredo, Esmeralda Paupério, Gerardo Salazar, and Olha Tikhonova
CONSTRUCT-LESE, Faculty of Engineering, University of Porto, Porto, Portugal (xnr@fe.up.pt)

Cultural heritage is universally recognized as an essential part of the socio-cultural and economic capital of a country. Current policies emphasize the strong contribution and cross-cutting nature of cultural heritage to achieve strategic goals for a smart, sustainable and inclusive growth. Furthermore, the important role that cultural heritage plays in creating and enhancing social capital has been particularly highlighted, as well as its economic impact. Nevertheless, natural hazards cause serious threats to cultural heritage, and severe damage and losses are recurrently seen to affect it due to these types of events. While such impacts can be seen to stem from a variety of sources, their physical characteristics play a significant role in their vulnerability to natural hazards. Therefore, it is imperative to explicitly consider cultural heritage in natural hazard risk reduction and management initiatives, from local to national and global scales, supported by rational and knowledge-based vulnerability and risk assessment studies.

However, the development of such assessments for a large number of cultural heritage assets in a region presents several challenges. Firstly, there is a shortage of methodological approaches to model the vulnerability and risk of cultural heritage assets to different natural hazards. Secondly, performing detailed vulnerability/risk analyses for every cultural heritage asset on a large scale (i.e. across a region or a country) would require resources that are unavailable in most cases. Finally, adequate post-disaster damage and loss data to support the development of methodologies is almost inexistent in this sector, namely due to a lack of approaches to do so, and to the difficulties in expressing intangible losses in quantitative terms.

In this context, this presentation will showcase recent advances in these fields developed within the ongoing research project RIACT (Risk Indicators for the Analysis of Cultural Heritage under Threat). These include the development of simple but robust approaches for the analysis of the vulnerability and risk of cultural heritage at various scales and their application in pilot case studies, the development of a database for collecting disaster damage and loss data in the cultural heritage sector, and the development of methodologies for cultural heritage disaster damage valuation and value-based post-disaster recovery prioritization. Ultimately, these research efforts aim to support stakeholders responsible for cultural heritage management and preservation in improving their adaptive capacity to plan for and respond to natural hazards.