

DEVELOPING A 3D WEB-GIS MAPPING PLATFORM TO SUPPORT SEISMIC VULNERABILITY ASSESSMENT OF URBAN AREAS: AN INTRODUCTION

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In 2020, natural disasters globally affected around 100 million people, causing substantial economic and human losses. The population density in low-lying coastal or riverside areas heightens the risk of significant impacts from natural disasters. Due to its location, Portugal's tectonic environment induces low to moderate seismic and co-seismic hazards with the potential for considerable economic and human losses, especially in urban areas like Lisbon, underlying the urgency for enhanced risk assessment and preparedness strategies. While robust seismic risk models exist for Lisbon, the absence of a user-friendly tool capable of automatically estimating real-time earthquake damages and safe rescue pathways is a notable gap. This is where the proposed 3D web-GIS platform will play an important role.

This platform aims to provide dynamic maps that illustrate the city's vulnerability to these natural disasters. The incorporation of 3D model buildings will enhance the visualization and communication of potential impacts and losses, thus facilitating more effective preventive and response measures. The platform's dynamic nature allows the integration of various models, including those for assessing building collapse risks and identifying priority areas and safe rescue routes. With dynamic, visual, and interactive representation of seismic risk data, the platform will enhance seismic vulnerability comprehension and improve the decision-making process for various stakeholders. For policymakers and urban planners, this platform will offer a powerful tool for visualizing the potential impacts of seismic events, aiding more effective urban planning and risk mitigation strategies. It will also provide emergency response teams with critical information for swift and safe response actions in the aftermath of an earthquake, potentially saving lives and reducing economic losses, ultimately contributing to safer, more resilient urban environments.

The PhD thesis, entitled "Developing a 3D Web-GIS Mapping Platform to Support the Seismic Vulnerability Assessment of Urban Areas," which forms the basis of this abstract, is in its early stage. The research is currently in a comprehensive literature review, concentrating on seismic risk modelling, specifically in Lisbon

City. This initial stage is crucial for identifying potential gaps and opportunities in current methodologies, which will inform and guide the development of the web-GIS platform.