

BIM2ESCAPE – The use of BIM to support the definition of escape routes

Summary

BIM2ESCAPE project developed a methodology for identifying emergency routes, inside heritage buildings, taking into account the shortest path and seismic vulnerability. This research is especially challenging for buildings with complex geometries and older structures that may not have clear and easily accessible escape routes in the event of an earthquake. This is particularly important for tourists who are unfamiliar with the place.

Extensive research has been conducted on building indoor navigation applied to a path network, on which spaces are represented by nodes and edges represent the relation between spaces. Graph algorithms applied to a such network are able to compute the shortest,

fastest or most secure route, according to a specific cost function. However, for building indoor environments other requirements and problems may emerge as a path with fewer turns, or less stairs or fewer vertical routes.

The case study is Palácio Nacional de Sintra, due to its heritage importance, is one of the more visited palaces in Portugal, built in an area that is vulnerable to seismic events. For that purpose, the cost function is defined as a combination of distance and seismic vulnerability, stored in the Palace H-BIM model.

The proposed methodology is able to be applied to other buildings as long their geometry and properties have been stored in a BIM.

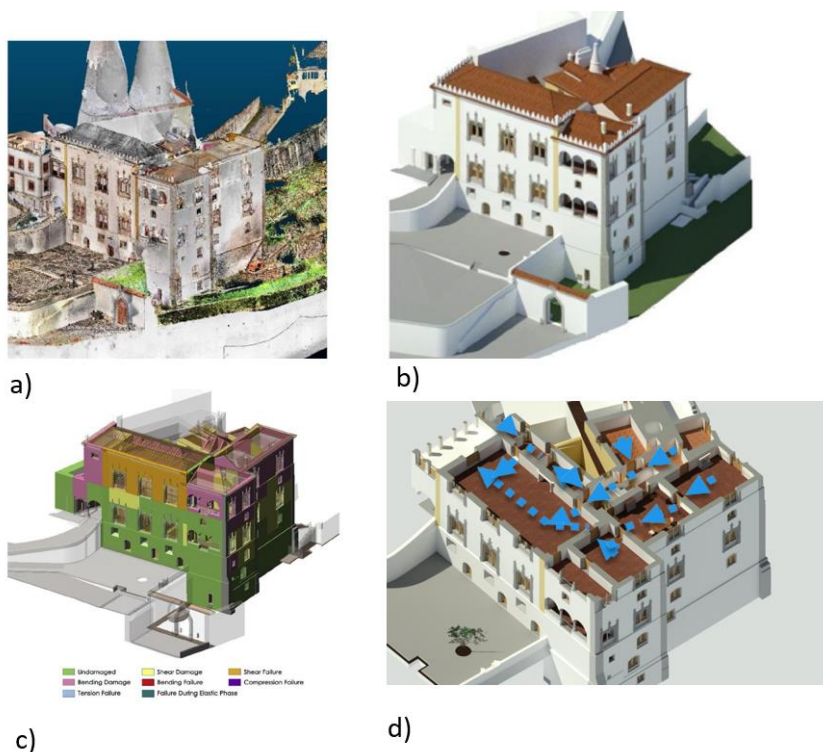


Figure 1. Palácio Nacional de Sintra: a) Terrestrial Laser Scanning and UAV point cloud; b) H-BIM model; c) Seismic vulnerability assessment; d) Emergency routes.

Project Reference

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Leading Institution

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7 500.00€

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Project Website

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