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International Doctoral Program in Civil and Environmental Engineering

SEMINAR

Digital documentation and information modeling to support risk management of cultural heritage

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Brasil

Location:

UNIPG Campus of Engineering
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Timetable:

October 10th 2024 - 3:00 p.m. (CET)

Abstract

Heritage constructions present high cultural value, complexity in the structural systems, high variability, and considerable lack of systematic information on the materials, mechanical, and durability characteristics. In recent years, with the advancing of data capture and model processing technologies, several strategies for BIM applications in new and existing buildings have been reported in the literature. In this context, studies on heritage constructions show that HBIM (Historical or Heritage BIM) is emerging. The seminar aims to present a comprehensive overview of the researcher activities developed by the Research Group on Documentation and Information Modeling of Historic Buildings in the scope of the project DOCUMENTA of the Federal University of Ceara, explicitly focusing on research topics that are still open and need to be advanced, such as strategies for record and documentation in high accuracy, as-built 3D modeling from point clouds, automation of the 3D modeling of complex shapes, new approach for point clouds segmentation and semi-automatic modeling of constructive elements, HBIM performance and historical databases. Further, this seminar will also discuss the results of the risk assessment and the development of a new method to evaluate the climatic influence on historic building degradation.

Keywords: HBIM, digitalization, risk assessment, climatic changes, performance;



Esequiel Mesquita is Professor of the Department of Architecture, Urbanism, and Design and the Coordinator of the Graduate Program in Civil Engineering at the Federal University of Ceara (UFC). He holds a Ph.D. in Civil Engineering from the Faculty of Engineering at the University of Porto and was a Visiting Professor at the Institut National des Sciences Appliquées - Rouen (France, 2023) and, more recently, at the University of Pisa. He is the Editor-in-Chief of the Journal of Building Pathology and Rehabilitation (Springer) and Guest Editor of Digital Applications in Archaeology and Cultural Heritage. He is an expert member of ICOMOS and RILEM, and he is involved in several national and international projects, with strong collaborations with South America and Europe. He is also the Coordinator of the project Technology and Innovation of Cultural Heritage of Ceara, supported by FUNCAP, which promotes digital surveys, 3D models for preservation and documentation, innovative HBIM tools. He has a strong background in building pathology and SHM. More recently, he has dedicated his academic career to research in cultural heritage, digitization, HBIM, structural vulnerability and risk mitigation of natural and anthropogenic hazards and climate change in the context of cultural heritage. His academic contributions extend to more than 120 publications, including more than 50 articles in leading international journals, while he supervised and co-supervised undergraduate, master, and PhD students.

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