ABC^{PhD} OPENTalks 2022

UMBERTO ALIBRANDI

Wednesday 15 June , 11h30 in CAMPUS
LEONARDO aula Castigliano

Risk-informed Digital Twin (RDT) for sustainable and resilient buildings and infrastructures

Sustainability for the built environment may be addressed through lifecycle functional and structural integrity of buildings and infrastructures. To this aim, city governments are relying more and more on digital technologies. An attractive tool is the Digital Twin which is a virtual replica of real world buildings, processes, structures, people, systems aimed at answering questions about its physical part, the Physical Twin. To cope with the several sources of uncertainty it has been recently introduced the Risk-Informed Digital Twin (RDT) which integrates through the Information Theory tools of Statistics, Uncertainty Quantification, Risk Analysis, Machine Learning, Decision making under uncertainty. In the talk I will discuss the main features of this potentially disruptive technology, toward the achievement of the UN Sustainable Development Goals with reference to the built environment

Umberto Alibrandi is Associate Professor at Aarhus University, Denmark. He applies methods of Performance Based Engineering, Structural Reliability and Risk Analysis, Computational Stochastic Mechanics, Risk informed Decision Support for structures, Machine Learning, and Artificial Intelligence for academia and industry for more than 20 years.

His current research interests focus on the development of new data-driven risk-based frameworks, methods, and tools aimed at sustainable and resilient urban communities. More specifically, to cope with the inherent complexity and uncertainty, he is developing a novel framework of data-driven uncertainty quantification and risk analysis rooted on the information theory. The framework will be tailored to the deployment of Risk-informed Digital Twins (RDT) for design and management under uncertainty of smart buildings and infrastructures. The tools of the RDT are going to be deployed inside the opensource software OpenAIUQ (umbertoalibrandi.com)