

Risk-Informed Digital Twins for the built environment: toward Sustainability and Resilience Based Engineering (SRBE)

Description

Urban resilience has conventionally been defined as the "measurable ability of any urban community to maintain continuity through all shocks and stresses, while positively *adapting and transforming* towards *urban sustainability*. To target sustainable growth models of the urban communities and green transition paradigms, city governments are relying more and more on digital technologies. Novel tools, methods and frameworks of data-driven uncertainty quantification and risk-analysis are going to be developed and implemented to this aim.

Motivation

The Digital Twin (DT) is a virtual replica of buildings, processes, structures, people, systems created and maintained in order to answer questions about its physical part, the Physical Twin (PT). Multiple sources of uncertainty during the lifecycle challenge our prediction capabilities. It follows the significance of the Risk-Informed Digital Twin (RDT) for urban resilience and sustainability, uncertainty quantification, random vibrations, risk analysis, decision making under uncertainty, network theory, machine learning and computer science are fully integrated.

Objective

This special session aims at presenting state-of-the-art and new algorithms and tools of data-driven uncertainty quantification and risk analysis, including novel design concepts and methodologies related to the broad area of risk-informed digital twins for the built environment. Practical applications and real world examples are encouraged. The contributions of this special session are expected to lay the foundations of a novel paradigm of Sustainable and Resilient Based Engineering (SRBE).

Organizers

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