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DEPARTMENT OF CIVIL
AND ENVIRONMENTAL
ENGINEERING

Strategic Research Dialogues
Shaping the Next Generation of the Built Environment

1st July 2026, h 12:00
Campus of Engineering, Main Hall

introduction

Filippo Ubertini

Chair of the Department of Civil and Environmental Engineering

Silvia Meniconi

Coordinator of the International Doctoral Program
in Civil and Environmental Engineering

seminar

**Rethinking Building Performance:
Integrating Human Appraisal
to Support Resilience, Resource Efficiency
and Occupant Experience**

invited speaker

Alessandra Luna Navarro

Assistant Professor in Façade Design and Engineering
TU Delft, Delft University of Technology

Abstract

The energy transition, climate adaptation, and resource scarcity are fundamentally reshaping the performance requirements of buildings and their envelopes. Yet while building technologies have become increasingly sophisticated, our understanding of how people experience, interact with, and adapt to these environments remains comparatively limited. This presentation explores the role of human factors for building performance and argues that bridging the gap between technical performance and occupant appraisal is one of the central challenges for the next generation of building technologies. Drawing on research conducted at the University of Cambridge and TU Delft, the talk presents insights from laboratory experiments, living-lab studies, and field investigations in homes and offices across Europe. Particular attention is given to three interconnected themes. First, occupant experience beyond comfort, exploring how people perceive and respond to buildings through multiple sensory and psychological dimensions. Examples include research on biophilic responses, soundscape perception, visual experience through façades, perceptions of safety, agency and control, and the interactions between thermal, visual, and acoustic domains that shape overall environmental appraisal. Second, resource efficiency and circularity, examining how human appraisal influences the acceptance of material-efficient and reused building components. Examples include studies on façade defects, optical haze in glazing, serviceability limits, and the divergence between technical performance criteria and user acceptance in circular façade systems. Third, resilience and vulnerability, investigating how buildings and occupants respond to multiple hazards and environmental stressors across their life cycle. Examples include the development of thermal fragility curves to quantify vulnerability to extreme heat, as well as multi-hazard resilience frameworks that integrate climate-related and structural risks to support adaptation and renovation decisions.

About the speaker

Dr. Alessandra Luna Navarro is Assistant Professor in Façade Design and Engineering in the Department of Architectural Engineering and Technology at TU Delft, where she leads the Human-Building Interaction research group and the MATELab and SMARTLab research facilities. Her research lies at the intersection of building technology, façade engineering, and human experience, investigating how people perceive, interact with, and adapt to building environments. She obtained a Master in Building Engineering and Architecture at Sapienza University, and a Master's degree in Energy engineering from the University of Cambridge, where she also conducted research on human-building interaction and obtained her PhD across Engineering and Psychology school. She has also held visiting scholar positions at UC Berkeley and Politecnico di Milano. Dr. Luna Navarro is Principal Investigator of several nationally and internationally funded projects, and part of several IEA EBC Annex initiatives. Her work has been recognised with multiple awards, including the Best Young Researcher Award at the 9th International Building Physics Conference (2024). She is Editor of the Journal of Façade Design and Engineering and Glass Structures and Engineering, and a Chartered Engineer with CIBSE and the Italian council of engineering.