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DEPARTMENT OF CIVIL
AND ENVIRONMENTAL
ENGINEERING

Strategic Research Dialogues
Shaping the Next Generation of the Built Environment

18th June 2026, h 15:00
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

From Pixels to Policies: How Satellite Radar is Reshaping Risk, Response, and the Future of Earth Observation

invited speaker

Pietro Milillo
Assistant Professor, University of Houston – German Aerospace Center (DLR)
NASA Surface Topography and Vegetation Applications Lead

Abstract
Satellite radar remote sensing has evolved from a specialized measurement technique into a powerful decision-support technology. Yet a critical gap persists between what we can measure from space and the decisions that society needs to make about infrastructure risk, disaster response, and environmental management. This seminar examines the complete data-to-decisions pipeline through three complementary lenses. First, the forward pipeline: how InSAR-derived ground deformation measurements, once uncertainty is rigorously quantified, become actionable inputs for insurance markets and infrastructure risk assessment. Second, the compressed pipeline: how radar-based damage mapping algorithms, enable rapid, unsupervised identification of building damage after earthquakes, floods, and other disasters, delivering critical information to emergency managers within hours rather than weeks. Third, the inverted pipeline: how NASA's Surface Topography and Vegetation (STV) program works backward from societal needs to define science and application goals that will shape the next generation of satellite missions. By weaving these perspectives together, the seminar argues that the most important unsolved problems in Earth observation lie not in the measurements themselves, but in the space between measurement and decision, where uncertainty must be quantified, communicated, and ultimately managed.

About the speaker
Born in Apulia (Italy), Pietro Milillo holds a degree in Physics from the University of Bari and a PhD in Environmental Engineering from the University of Basilicata. Italy. He is Assistant Professor of Civil and Environmental Engineering at the University of Houston, where he leads the Remote Sensing and Digital Engineering laboratory. Before joining UH, he held research positions at NASA's Jet Propulsion Laboratory / Caltech and at the German Aerospace Center (DLR), where he maintains an active research affiliation. He is currently an IEEE Senior Member. His work focuses on satellite radar remote sensing (InSAR/SAR) for ground deformation monitoring, digital terrain model generation through radargrammetry, natural hazard assessment, and infrastructure risk evaluation. He develops new algorithms for unsupervised change detection in SAR time series, enabling rapid damage mapping after natural and anthropogenic disasters. He is co-founder of Tera Monitoring Solutions, a company that operationalizes InSAR technology for commercial infrastructure and insurance market applications. He serves on NASA's Surface Topography and Vegetation (STV) designated observable study team, contributing to the definition of science and application goals for future satellite missions. He is the recipient of NASA CESRA and STV awards, and has authored over 50 peer-reviewed publications In high-profile journals including Nature Communications, Nature Geoscience, Science Advances, and Remote Sensing of Environment.