

SPECIAL SESSION

Drone and NDT for cultural heritage and civil infrastructures

ORGANIZED AND CHAIRED BY: Andrea Maria LINGUA¹, Filiberto CHIABRANDO², Caterina BALLETTI³, Valentina GIRELLI⁴, Silvano VERGURA⁵

ORGANIZATION: Politecnico di Torino - DIATI¹, Politecnico di Torino - DAD², IUAV Venezia³, Università di Bologna⁴, Politecnico di Bari⁵

CONTACT EMAIL: andrea.lingua@polito.it, filiberto.chiabrando@polito.it, caterina.balletti@iuav.it, valentina.girelli@unibo.it, silvano.vergura@poliba.it

OBJECTIVE AND TOPICS

The conservation of cultural heritage and the safety of civil infrastructures represent crucial challenges for sustainable development and the protection of our collective identity. Non-Destructive Testing (NDT) and Evaluation (NDE) techniques provide unique opportunities to assess the structural integrity and material condition of artworks, monuments, bridges, tunnels, and buildings without causing damage or interruption of service. Recent advances in digital technologies, sensors, and data analytics — including RGB images, thermographic sensors, multi/hyperspectral cameras, laser scanning, and AI-based data interpretation — are transforming the way we monitor and preserve both historical assets and modern infrastructures.

This special session aims to foster collaboration between experts in NDT, materials science, conservation, and civil engineering, highlighting innovative applications, case studies, and integrated monitoring approaches.

Areas of interest include, but are not limited to:

- Advanced NDT and monitoring techniques for cultural heritage materials (stone, wood, plaster, metals).
- Structural health monitoring (SHM) of civil infrastructures (bridges, tunnels, dams, buildings).
- Infrared thermography, multi/hyperspectral images for detecting cracks, detachments, and moisture.
- Integration of NDT with digital tools: 3D scanning, LiDAR, and digital twins.
- AI, machine learning, and data fusion for damage detection and predictive maintenance.
- Case studies of heritage site diagnostics and infrastructure rehabilitation.
- Use of drones and robotics for inspection in inaccessible or delicate environments.
- Standardization, data management, and certification aspects in NDT for heritage and infrastructure.
- Artificial Intelligence for data processing.
- Machine learning and computer vision algorithms for automated image analysis.

All the instructions for paper submission are included in the conference website: <https://www.ecndt2026.org>