Advances in SHM guided by Artificial Intelligence and Data Fusion

TRACK Number (1000 to 2000)

ilaria venanzi\*, filippo ubertini\*   
and simon laflamme†

\* University of Perugia

Via G. Duranti 93, 06135, Perugia, Italy

[ilaria.venanzi@unipg.it](mailto:ilaria.venanzi@unipg.it); [filippo.ubertini@unipg.it](mailto:filippo.ubertini@unipg.it)

† Iowa State University

813 Bissell Rd., Ames, IA, USA

[laflamme@iastate.edu](mailto:laflamme@iastate.edu)

**Key words:** Artificial Intelligence, Structural Health Monitoring, machine learning, deep learning, data fusion.

ABSTRACT

The increasing availability of heterogeneous data from monitored civil structures and the development of advanced signal and image processing methods provide opportunities for improving efficiency and robustness of SHM systems via the integration of information from multiple sources.

The possibility of fusing data collected by complex sensor networks combined with the Internet of Things paradigm have led to significant advancements in health monitoring and condition assessment of civil structures. In this context, artificial intelligence, and more specifically deep learning and machine learning techniques, are gaining increasing attention, as they allow to manage efficiently a large amount of data and information.

This special session focuses on AI-based solutions for structural identification, damage detection and health monitoring of structures, physics-informed learning, data driven approaches and data fusion in SHM, including but not being limited to applications for bridges, buildings and strategic infrastructures.