

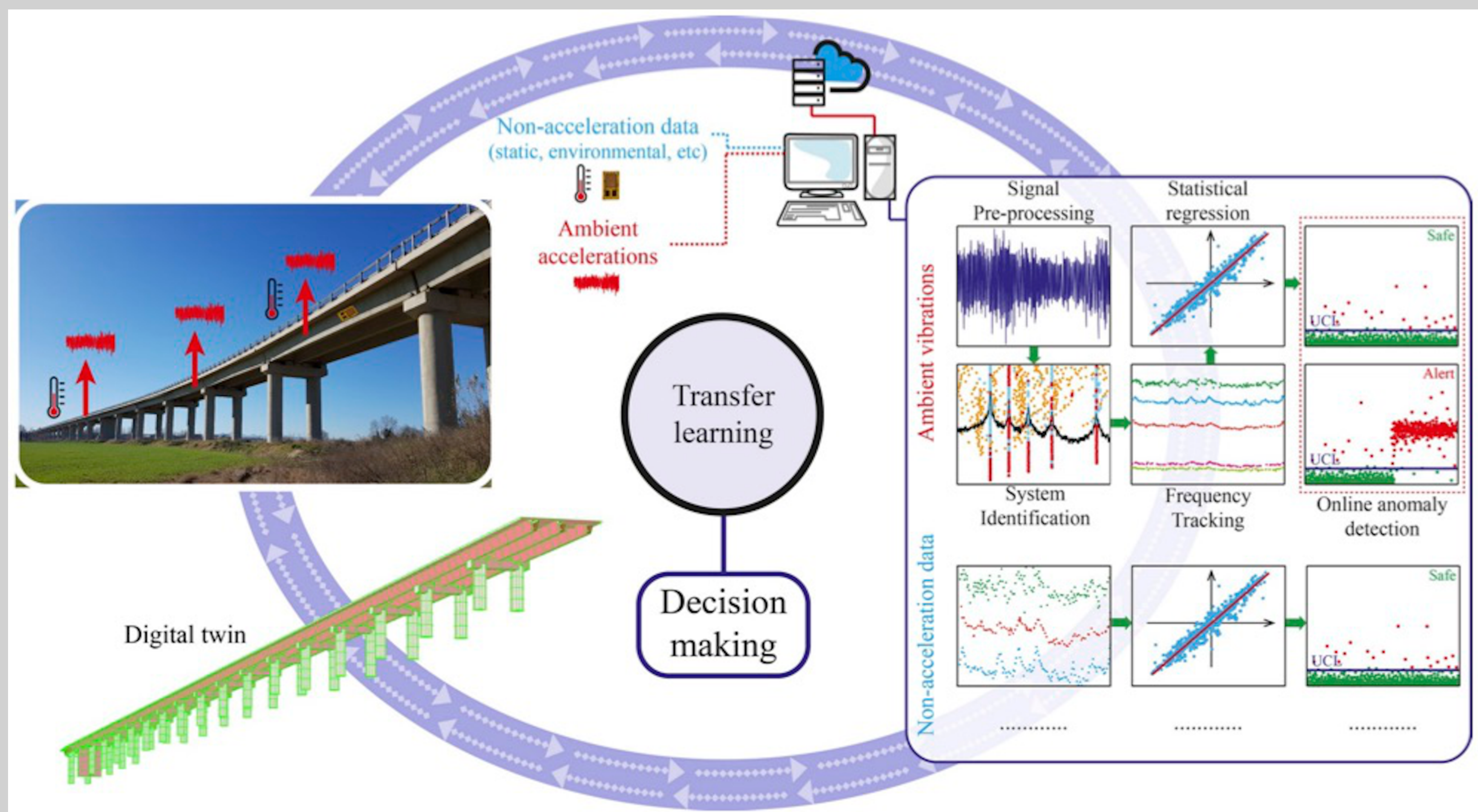


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The role of SHM in the risk assessment process of ageing bridges: an overview of ongoing research efforts in light of the new Italian code provisions



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Día : **Viernes 9 de abril de 2021**

Hora : **10:00h**

Lugar : **https://sl.ugr.es/meet_MEST_SEM**

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Italy, likewise many other western countries, is facing a tremendous challenge in quantifying and ensuring safety of existing infrastructure network with a special focus on ageing bridges, tunnels, dams and power plants. The societal awareness about the issue of ageing bridges is particularly strong and has grown significantly after the dramatic collapse of the Morandi bridge in Genoa occurred in 2018. In order to provide the different public and private road managing authorities with a standard tool for safety management of bridges, the Italian Ministry for Public Works has published in 2020 a new code called "Guidelines for risk classification and management, safety evaluation and monitoring of existing bridges". Such guidelines, which are currently undergoing a validation period which will be supervised by the Italian Scientific Community, represent a quite unique and innovative technical code at the international level, where the priority of intervention in bridges results from the application of an objective and quantitative method based on periodic inspections, non-destructive evaluation tests, structural analysis and Structural Health Monitoring (SHM). The role given to SHM is the specific focus of this talk. According to the new guidelines, SHM comes into play when the bridge is classified in a highly critical condition and the role of SHM is that of monitoring the evolution of a known defect for a limited period of time, before the structural upgrade intervention, in such a way to anticipate major consequences and take informed decisions. This poses the SHM paradigm into a clear direction as a fundamental "tactic" tool to monitor safety for limited time periods and with respect to highly critical conditions.

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Filippo Ubertini is a Full Professor of Structural Design at the Department of Civil and Environmental Engineering of University of Perugia where he teaches Advanced Structural Design and Earthquake Engineering and where he coordinates the International PhD Program in Civil and Environmental Engineering. He graduated cum laude in Civil Engineering at University of Perugia in 2005 and received his PhD in Civil Engineering from University of Pavia in 2009.

He was visiting scholar at Columbia University in 2008. Author of more than 90 papers published in high impact international journals, his research is mainly focused on structural health monitoring, with emphasis on vibration-based methods, smart materials and applications to bridge engineering, earthquake engineering and cultural heritage structures. He is a member of the editorial boards of: Mechanical Systems and Signal Processing, Sensors, Advances in Civil Engineering, Shock and Vibration, Mathematical Problems in Engineering, Engineering Research Express and Engineering Proceedings.

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