

SHM, a privileged field of application of NDE4.0 concepts and technologies

Vincent Le Cam¹

¹Components and Systems (COSYS) Department, University Gustave Eiffel, France

SHM is defined as the process and the required technologies of acquiring and analyzing data from permanently installed sensors to assess structures health. In particular, SHM is a way to monitor the occurrence of damage during the service life of the structure and, in this sense, it is a promising maintenance strategy complementary to traditional NDE. Since several years French laboratories as industrial actors gathered under the aegis of the French NDE society (COFREND) in order to promote the development of SHM. SHM is much more than a simple in situ NDE. Intrinsically, it involves data management, communication and analysis, and therefore constitutes a privileged field of application of NDE 4.0 concepts and technologies. This presentation will illustrate this idea via several examples of applications issued from recent research activities performed in France: a solution for the detection and localization of wire-breaks in bridge cables, an ultrasonic monitoring of railways to prevent from their invisible defects, wind-turbine monitoring by means of modal analysis, etc... Some key challenges will be drawn to make viable the SHM extension : from emerging Artificial Intelligence algorithms that pave the ground of new visions for signal processing strategies to the technical challenges of energy harvesting or IOT protocols for embeded sensors. Other sensible aspects will be evoked like the potential impact of SHM on the professions dans "durability" those technologies have to take into account.