Recent Advances in Ultrasonic Techniques for Structural Health Monitoring

Dr. Salvatore Salamone
University of Texas at Austin

The increase in traffic volume and loads applied to the aging and deteriorating infrastructure systems, the desire to reduce downtime associated with regular maintenance operations have all sparked interests and researches into structural health monitoring (SHM) methods. Such researches are fueled by the evolution of the maintenance paradigm from “time-based” to “condition-based”, which implies that a sensing and processing system, integrated with the structure, notifies the operator in real-time that degradation is occurring. While a wide variety of SHM methods have been proposed, in this presentation recent developments in state-of-the-art ultrasonic wave-based methods will be presented. The advantages of these methods include: (1) the use of low profile sensors that can be permanently attached to the structure to perform real-time monitoring and routine inspection with the same sensing system, (2) the ability to probe a large area of the structure, locating damage from only a few monitoring points and (3) the capability to detect both active cracks and pre-existing cracks by toggling between the modes of “passive” acoustic emission testing and “active” ultrasonic testing. The presentation will discuss research issues and challenges, along with some examples of research being undertaken in the smart structures research group at UT.

About Dr. Salamone: Dr. Salvatore Salamone is an Associate Professor in the Department of Civil, Architectural and Environmental Engineering (CAEE) at University of Texas (UT) at Austin. Before joining UT, Salamone was an Assistant professor at University at Buffalo (SUNY), and a postdoctoral fellow at University of California, San Diego. He received his PhD (2007) from the Universita’ degli studi di Palermo. Salamone’s current research interests include structural health monitoring, non-destructive evaluation, ultrasonic sensing methods for smart structures, wave propagation in solids, digital signal processing and pattern recognition. His research is sponsored by federal and state agencies including the National Science Foundation (NSF), the Office of Naval Research (ONR), the Federal Rail Administration (FRA) and the Texas Department of Transportation (TXDOT). Dr. Salamone published 46 peer-reviewed journal papers and 90+ conference papers and presentations. His research contributions have been recognized by the 2014 Achenbach Medal, an international award that recognizes an individual who, within 10 years of Ph.D., has made an outstanding contribution to the advancement of the field of structural health monitoring. He has also received the 2011 Faculty Grant Award from the American Society for Nondestructive Testing. He is serving in several technical committee including, the ASCE Structural Health Monitoring and Control, and ASME Ultrasonics for Mechanical Systems.

Monday, June 25th 2018, 11:30
Sala del Camino - Palazzo del Broletto
Piazza della Vittoria 15 – Pavia