The application of wave-based inspection methods for the analysis of the state of health of structural components has received significant attention in recent years. The propagation and GUW, together with the application of Scanning Laser Vibrometry for full wavefield measurement enables the introduction of novel damage detection techniques which are based on the application of filtering techniques in the frequency/wavenumber space.

The goal of these techniques is to separate the contribution of damage from the overall response of the structure, thus highlighting its presence and location. This presentation will provide an overview of techniques developed for the analysis of guided wavefields and their application for damage detection, structural characterization, and for the design of novel transducers for structural health monitoring. These transducers feature patterns that enable wave steering through the selection of the excitation frequency, and the measurement of multiple strain components for surface acoustic wave-based sensing of strain.

**Professional Profile:**

Massimo Ruzzene is a professor of aerospace and mechanical engineering at Georgia Institute of Technology. He is currently the program director for the Dynamics, Control and System Diagnostics Program of CMMI at the National Science Foundation. Ruzzene is the author of two books, 135 journal papers and 180 conference papers. He has participated in projects funded by the AFOSR, ARO, ONR, NASA, U.S. Army, U.S. Navy, DARPA, and NSF, as well as numerous companies. His work focuses on solid mechanics, structural dynamics and wave propagation with application to structural health monitoring, metamaterials, and vibration and noise control. Ruzzene is a Fellow of ASME, an Associate Fellow of AIAA, a member of AHS and ASA.