



AVVISO DI SEMINARIO

From aerospace to biomedical: Non-Destructive Evaluation and damage detection of complex structures

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ABSTRACT: Towards everyday safety, efficient mobility, cost savings and sustainability, structures have moved to more complex materials and designs. From transportation and energy infrastructure, to tissue and human organs, assessing structural health is a crucial task, especially to avoid catastrophic failures, achieve early diagnostics and eventually extend structural lifetime. However, the complexity of the material, geometries and structural assemblies, together with the complexity of damage formation and progression, create an infinite set of unknowns that make assessment an ill-posed problem. This proposition becomes increasingly challenging, when inspection requirements are considered, such as accessibility, in-service feasibility and robustness. In this talk, the non-destructive evaluation (NDE) of complex structures by elastic and thermal wave propagation approaches will be presented. In particular, ultrasonic guided waves (UGWs) techniques will be introduced, and their application to composite aerospace structures and biomedical diagnostics is presented. The inherent behavior of UGWs provides advantages in the inspection of complex structures, enabling detection, localization and monitoring of internal damage. The approach combines numerical analyses on the interaction of UGWs with damages, experimental UGW scanning and advanced signal processing techniques. The complexity of UGW propagation is leveraged as an opportunity to augment damage detection to characterization and monitoring, and improve diagnostics in an interdisciplinary setting.



BIO: *Dr. Capriotti is currently an Assistant Professor in the Department of Aerospace Engineering at San Diego State University (SDSU), focusing on Non-Destructive Evaluation (NDE) and wave propagation, where she is currently setting up her NDE Research Clinic. She received her Ph.D. in Structural Engineering from University of California San Diego in 2019, pursuing research in the Experimental Mechanics & NDE Lab. She previously graduated with her B.S. and M.S. in Mechanical Engineering at the University of Parma (Italy). She has been a postdoctoral Research Fellow at Mayo Clinic in the Department of Radiology, within the Ultrasound Research Lab. Her research aims at developing noninvasive techniques for defect detection, characterization and structural assessment of composite aerospace structures, using ultrasonic guided waves and heat diffusion. She is also interested in noninvasive techniques for biomedical applications, specifically shear wave elastography. Dr. Capriotti is a member of the Women in Engineering, Chair of the Diversity, Equity and Inclusion Committee in the Aerospace Engineering Department and co-advisor of the Women of Aeronautics and Astronautics, at SDSU. She enjoys and is active in international collaborations and is also the point of contact at SDSU for the Cluster Aerospace Exploire Marche.*

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