

AAE FALL COLLOQUIUM SERIES

Nondestructive Evaluation Without Disassembly

WEDNESDAY NOVEMBER 8TH, 2023
WALC 2007 3:30PM-4:20PM



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Biography

Dr. LoriAnne Groo is an Aerospace Research Engineer in the Material State Awareness Branch of the Materials and Manufacturing Directorate at AFRL. She received her BS in Aerospace and Ocean Engineering from Virginia Tech in 2016 followed by MS and PhD degrees in Aerospace Engineering from the University of Michigan in 2019 and 2021, respectively. Her current work within AFRL centers around two focus areas: integration of material assessment capabilities with robotic systems and integrated sensing for multifunctional, adaptive composite structures. In general, her interests lie in versatile, next-gen sensing and robotics.

Dr. John Wertz is an Aerospace Research Engineer in the Material State Awareness Branch of the Materials and Manufacturing Directorate at AFRL. He received his BS in Aerospace Engineering from The University of Arizona in 2008, followed by MS and PhD degrees in Aeronautical and Astronautical Engineering from The Ohio State University in 2010 and 2013, respectively. His current work within AFRL focuses on integrated sensing for damage detection in composite structures and fusion of data from multi-modal NDE sensors.

Abstract

Nondestructive evaluation (NDE) typically relies on surface-based sensors (e.g. eddy current, ultrasound, thermography, etc.) to inspect a component for damage or defects. These inspections are often performed manually or using a large, pre-programmed 6-axis robotic system with rigid fixturing. Agile access to, and inspection of, obscured surfaces, confined spaces, and complex geometries is difficult with current NDE technologies. Additionally, novel design and manufacturing technologies like topology optimization and additive manufacturing have the potential to produce structures of increasing geometric complexity. In this talk, Dr. John Wertz and Dr. LoriAnne Groo will highlight integrated sensing and robotics as two potential methods for NDE of complex and/or access-restricted structures.