

Title: Multiscale Health Monitoring of Critical Infrastructure Using Fusion-Based and AI-Assisted Noncontact Sensing Techniques (FIR040303)

Duration: April 2024 to March 2026

Deliverables:

D1: A robust methodology for non-contact mode for intelligent damage recognition

D2: Algorithm for detecting damage using image correlation-based technique

D3: Combined contact and non-contact sensing techniques for multi-scale SHM

Significant Achievements:

- Established experimental methodologies and test protocols for reliable damage detection using noncontact ultrasonic actuation and sensing techniques
- Investigated the capability of advanced noncontact imaging techniques for detecting and visualizing delamination damage in CFRP composite components
- Identified damage-sensitive ultrasonic parameters for the detection and characterization of defects in multilayer composite structures
- Demonstrated the integration of sensing, imaging, and artificial intelligence techniques for enhanced accuracy and reliability in structural health assessment

Team:

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