RX20-32

Research Title

Spatial Registration and Tracking of Nondestructive Evaluation Technologies

Individual Sponsor

Dr. John Wertz, AFRL/RXCA
AFRL/RXC Bldg. 655
2977 Hobson Way
WPAFB, OH 45433
john.wertz.1@us.af.mil

Academic Area/Field and Education Level

Computer Science, Computer Engineering, or Applied Mathematics (MS or PhD)

Objectives

Develop algorithms, methods, or techniques to track the three-dimensional (3D) spatial location of nondestructive evaluation (NDE) probes relative to inspected components. Use available tracking technologies (Microsoft Kinect, Microsoft HoloLens) and/or identify new technologies (Microsoft HoloLens 2, Magic Leap, etc.) to enable on-the-fly, operator-based tracking. Develop visual representations of damage or defects within the components correctly registered to the component itself, with additional visualization layers as necessary.

Description

Many Air Force inspections conducted in the depot or field use simple methods to track the location of damage within the component being inspected; furthermore, parameters describing the position and orientation of the inspection tool are often not tracked at all. To improve these inspection practices, a rapid, on-the-fly method of spatial registration and tracking for NDE is desired. The solution may utilize any combination of camera setups, zed cameras, inertial measurement units, or augmented reality wearables.

Research Classification/Restrictions

None.

Eligible Research Institutions

AFIT, The Ohio State University, Wright State University, The University of Dayton, and Iowa State University