

ENHANCED-CLR

BACKGROUND

SURVICE's Enhanced Coherent Laser Radar (E-CLR), originally developed for the Northrop Grumman F-35 center-fuselage assembly line, is one of the most accurate noncontact dimensional inspection tools in existence. Under an Air Force research grant, SURVICE enhanced a standard Nikon CLR by integrating a professional-grade photogrammetry system with advanced computer-vision technology to create a fully autonomous and programmable metrology solution.

PROBLEM – The process of locating/aligning a metrology device before measurements can be taken is typically a time-consuming, manual process that must be conducted before every measurement session and whenever the device is moved or bumped.



GOAL – Develop a kit to augment the standard Nikon CLR with a customized computer vision system that can automatically determine the position of the device in relation to a known reference.

RESULTS

- Demonstrated a significantly faster self-alignment functionality that can be applied with minimal training.



- Demonstrated the ability to detect vibrations that affect the quality of measurements and alert the operator of bad measurements and/or autonomously discard them and try again (allowing the tool to be used in assembly lines without requiring workers to move out of the way or stop work).
- Demonstrated the ability to scan extremely large volumes and operate in environments sensitive to foreign objects and debris (FOD).

POTENTIAL APPLICATIONS

- Industries that demand fast, highly accurate measurements of large parts or mating surfaces, such as the aerospace, defense, and automotive industries.

