GE Probe Positioning System

Overview
The focus of this project was to develop a software based positioning system for an NDT probe. The old system required a large apparatus composed of rotary encoders that restricted movement of the probe. Our goal was to create a system that would remove this large apparatus while preserving the accuracy of the system.

Objectives
The objective of our project was to develop an easy to use software-based system that accurately determines the location and orientation of an NDT probe using a mounted camera.

Approach
- Contacted and visited the project sponsor to determine customer needs and engineering requirements.
- Determined which camera to use based on camera specifications like frame rate and resolution.
- Determined best software to use for the system based on availability, functionality, and compatibility with the camera.
- Decided to track probe using red and blue material on the probe.
- Tested different materials to determine the best material based on brightness, cost, and glare from light.
- Wrote code for the system that acquired video from the camera and analyzed it to locate the probe in each frame.
- Fabricated a prototype of the system using the chosen camera, software, a camera mount, and a light.
- Ensured the outputs of the system were readable and easily understandable.
- Verified the system met our requirements through testing.

Outcomes
The outcomes of the project were:
- Created an accurate tracking system that cost just under $133 per system (not including software licenses).
- Created a system that eliminated the heavy and motion restricting apparatus of the old system.