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AT A GLANCE

2 Researchers led the project in conjunction with industry leaders as the community partner with senior controls engineering and electrical engineering experiences. 3 Student Researchers were guided and gained practical experience regarding robotics programming, vision, end of arm tooling design and manufacturing and an analysis.

Automated Technology: AGV Project

Project Overview

This project developed a proof of concept process applying various automated technologies in combination to be utilized in industrial inspection applications. The study focused research efforts by the merging of four pieces of technology in a unique manner;
1) an Autonomous Guided Vehicle (AGC)
2) a collaborative robot with designed end of arm tooling
3) a mobile vision application
4) a target based visual tracking and positioning system.
The overall concepts involve an AGV which can be programmed to follow a predefined path to determine locations where the mounted collaborative robot and the end of arm tooling will position a vision system in place to photograph a distinct location or area.

Milestones

Milestone 1: Establish communication between the AMR and the UR Robot.
Milestone 2: Autonomy of the AMR.
Milestone 3: Incorporation of vision systems to the UR Robot.

Key Findings

The team was able to successfully complete one of the the three main milestones. The Autonomy of the AMR had not been completely achieved due to the issues with the AMR sensors. The incorporation of a suitable vision system to the UR Robot had been completed successfully. The ROBOTIQ vision system software functioned appropriately with the robot arm and can make decisions based on the results of the vision system. The key findings from the project include:

- Basic vision systems were successfully implemented to the UR Robot and could be improved upon in the future.
- The Autonomy of the AMR is a work in progress as the issue of the sensors needs to be resolved before further progress can be made.
- Communication between both robots can be accomplished using programming languages such as Python over ethernet connection and will be integrated as soon as the AMR is fully operational as expected.

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