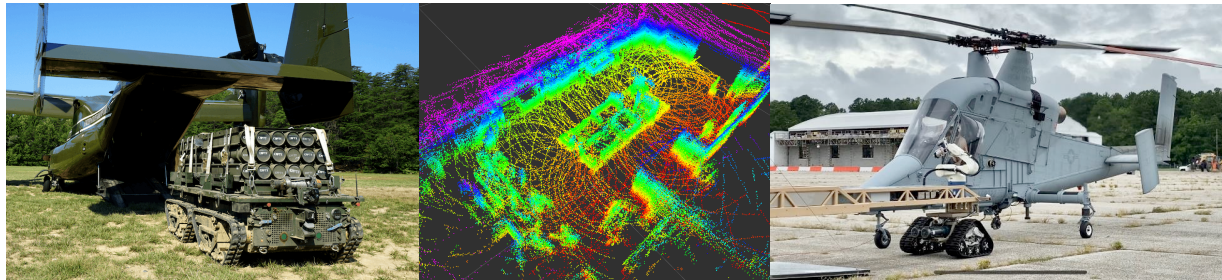




Operator Control Unit (OCU) UI Development for Robotic System



Company Background:

At Stratom, we are driving the future of automation by developing unmanned ground vehicles and autonomous robotic systems for commercial and defense applications — whether in safe, controlled settings or dynamic and challenging terrain.

Specializing in unmanned cargo movement, autonomous mobile robots (AMR) and robotic refueling, our proven tools, methods, technologies and strategic services continuously meet our customers' unique and evolving needs in logistics and operations. Our solutions enable them to reduce monotonous, difficult or dangerous tasks to optimize uptime and efficiencies, address labor shortages, increase profitability, and keep people safe.

Project Description:

An OCU provides the interface between an operator and an autonomous robotic system which can include physical buttons, control sticks, displays, and a digital user interface. What is needed is the user interface software for an OCU used to control a robotic vehicle washdown system. This UI will be built using the Flutter framework and the dart programming language. The UI will communicate with the robotic system over a ROS2 network. A ROS2 simulated robotic environment will be provided to test features of the UI.

This project will challenge students to develop a user interface that is reliable, responsive, and intuitive. Students will have the ability to leverage their knowledge of user interface design as well as software development skills to create a solution that allows for large vehicle washdown. The goal of this project is to create a UI that allows for seamless control of an autonomous vehicle washdown system designed for large and complex vehicles.

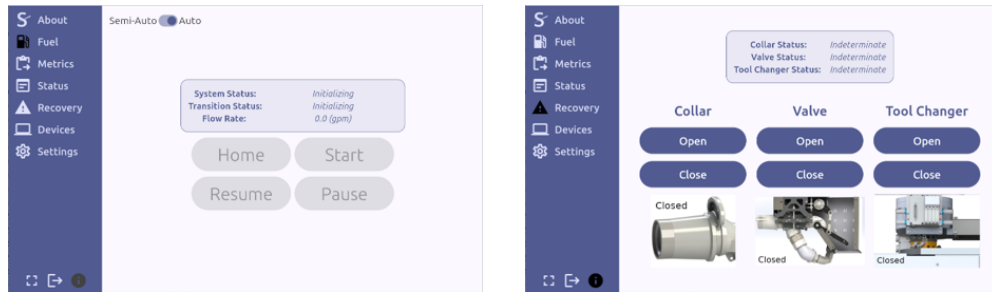


Figure 1: Sample Pages of an OCU UI

Students will focus their efforts on:

- System design of the UI
- Constructing the display elements which will show live camera feeds, sensor data, and system status
- Constructing input elements used by the operator to command the system
- Developing the communication layer with the robotic system to trigger autonomous actions or provide joystick control
- Testing the UI in a simulated environment

Desired Skillset:

- Flutter/Dart
- C++, Python
- ROS2
- Linux
- Docker

This project is an excellent opportunity for students to build on their experience in C++, Python, Flutter and Dart while developing practical skills in designing intuitive user interfaces for autonomous robotic control. Students will gain hands-on experience integrating software commands through a comprehensive user interface that will allow for autonomous vehicle washdown. While prior experience in all these areas is not required, students should be prepared for fast-paced learning and working through real-world robotic integration challenges.

Team Size: ~4 Students

Location:

Meetings will primarily be held remotely using Teams or Zoom. Our office is located in Louisville at 331 South 104th Street, Suite 235, where students may have the opportunity to get in-person support and/or and present a live demonstration of their results to the Stratom engineering team.

Note: All intellectual property developed as part of this project will be owned by Stratom