Developing and Integrating a Control Program for a Remotely Operated Vehicle

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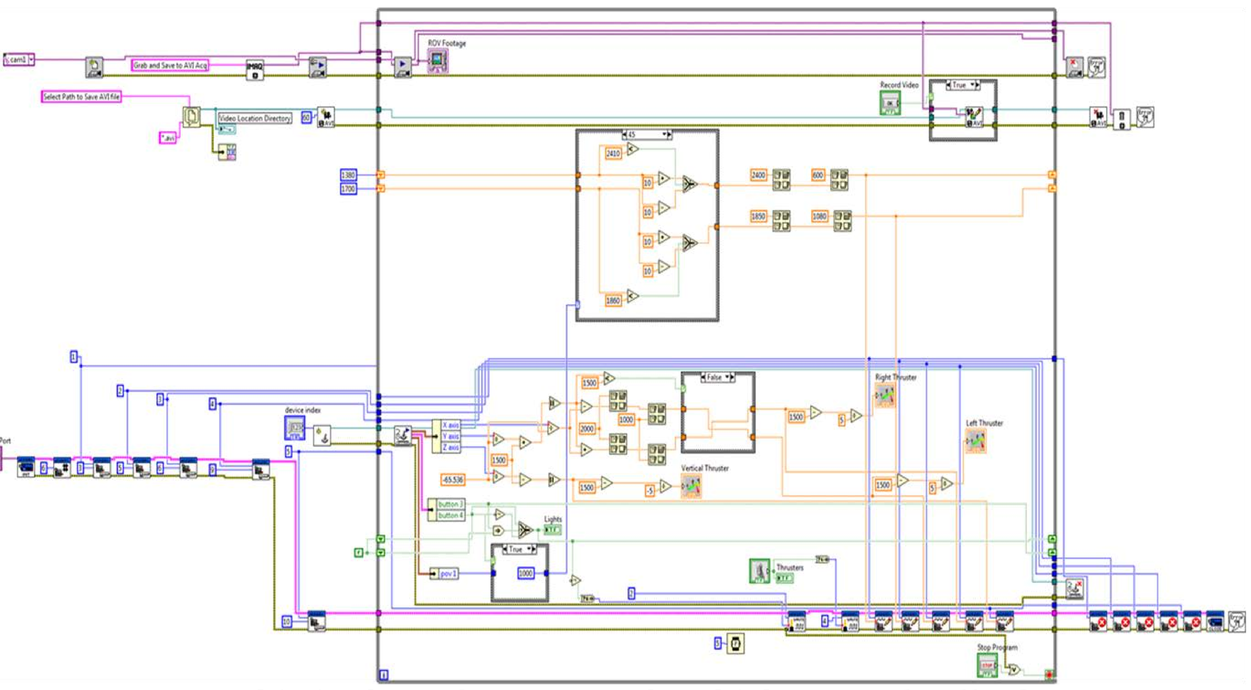
Abstract

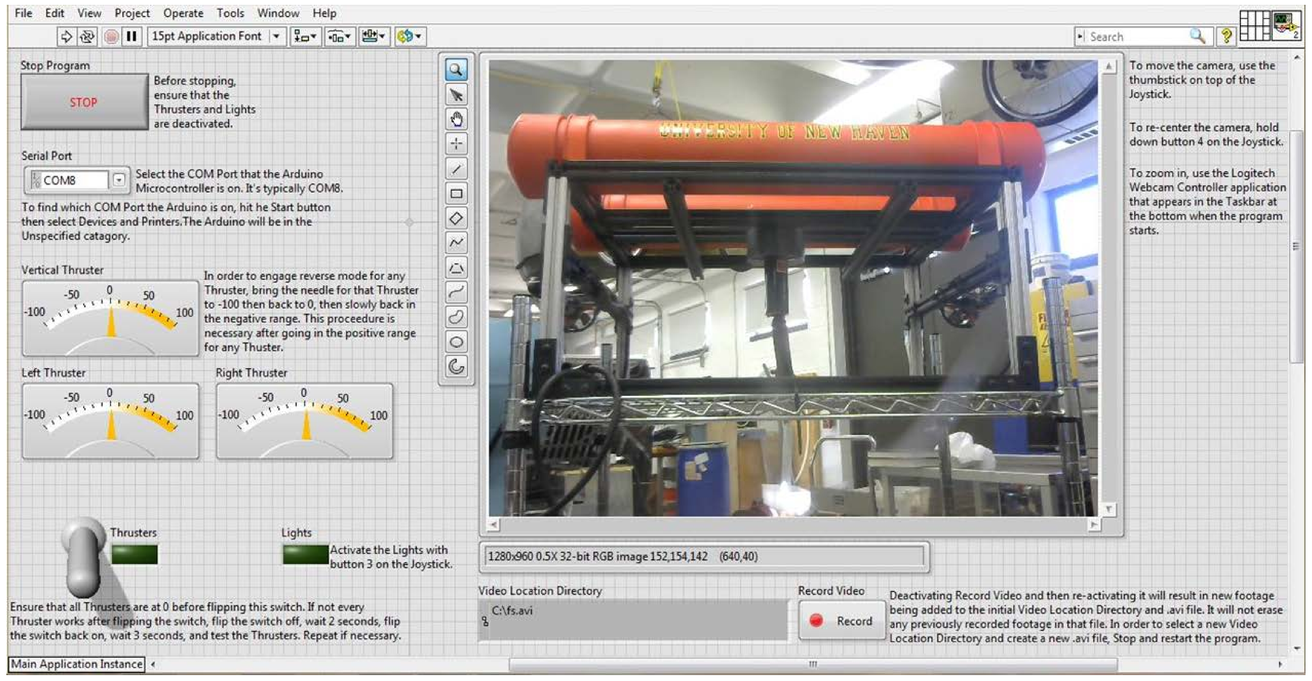
The objective of this SURF project was to create a user interface and control program for an Aquatic Remotely Operated Vehicle (ROV) using LabVIEW and Adruino. The overall desired outcome of this project was to allow a user to intuitively control the ROV's movement in an unknown underwater environment through utilization of a gaming joystick. Further functions include manipulating the facing direction of an on-board camera and viewing and recording real-time video. It is desired for additional sensory apparatuses to be added to the robot in future. Once completed, this ROV will serve as an educational tool for college level teaching in Marine Biology and Geography.

LabVIEW Code



This is the LabVIEW code which controls all of the ROV's operations, from video procurement, recording, camera movement control, light control, thruster activation, and thruster control.

LabVIEW Front Panel / User Interface



This is the LabVIEW Front Panel which serves as the user interface. It provides a display for live video from the on-board camera, thruster throttle and light indicators, and a recording control button. The operation instructions are also provided on the panel for easy reference.

Final Results

The control and interfacing functions have been programmed for intuitive operation for operators of all skill levels. The original electrical system from the previous design was modified and improved for better operational and communicational capability. The next step for this project is to successfully test it underwater to ensure its water resistance and real world performance. When the ROV's performance has been verified additional sensors will be installed to enhance the ROV's data gathering capabilities and practicality in Marine Biology and Geography education.