

Deep Vision Sonar Mount



OBJECTIVE

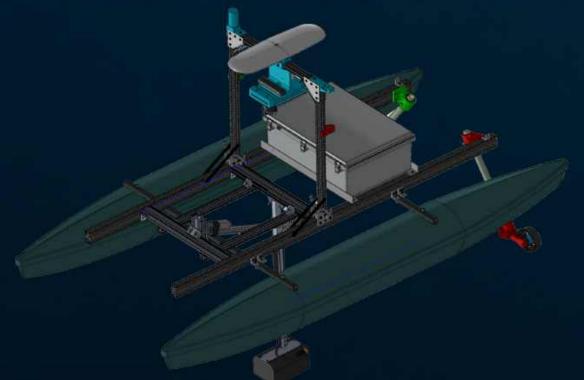
The Naval Information Warfare Center (NIWC) requires an operable sonar imaging sensor to be mounted to the developmental test platform - Green Uncrewed Surface Vessel (GUS-V), as well as the development of a machine learning vision algorithm to classify underwater objects using raw sonar data.

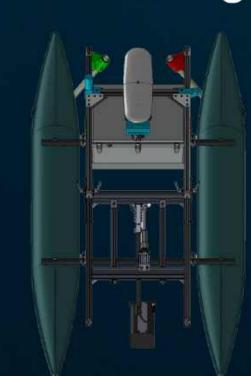
THE TEAM

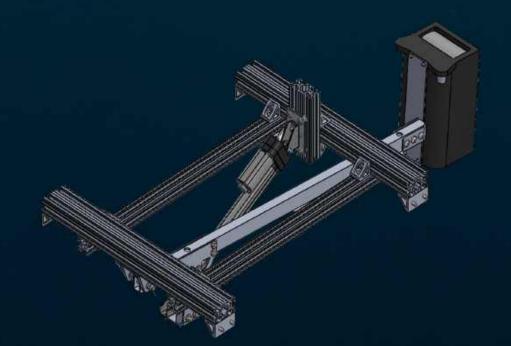
Thomas Kenton
Ethan McCaffrey
Joseph Morales
Emilee Smith
Sponsor: NIWC Pacific

MECHANICAL DESIGN

- 1. Aluminum Construction
- 2. 12V Linear Actuator
- 3. T-slot Aluminum Frame
- 4. Water Cut Aluminum Custom Parts
- 5. CNC Machined Clevis and Bearings

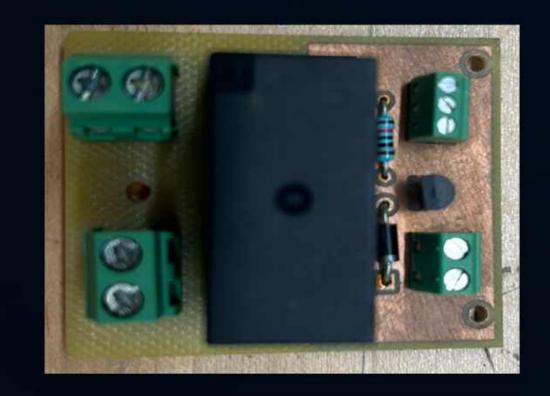






ELECTRICAL DESIGN

- 1. Custom PCB for Sonar & Linear Actuator Control
- 2. Two IP68 Water Resitant Bulkhead connectors
- 3. 12V & 48V Power Supply (Actuator & Sonar Respectively)
- 4. Controlled with Nvida Jetson GPIO Pins









SOFTWARE

- 1.Robot Operating System 2 (ROS2)
- 2. Allows for communicative C++ & Python Script Excecution
- 3. Ideal for multiple Sensors and Components
- 4. Allows for full remote or autonomous control of Sonar & Linear Actuator
- 5. You Only Look Once (YOLO) V9
- 6. Open Source Vision Algorithm for Object Detection and Identification
- 7. Used 10,000+ Manually Labeled Images to Train Model using RoboFlow
- 8. Identifies Circles, Squares, Triangles
- 9.PyTorch for image library

