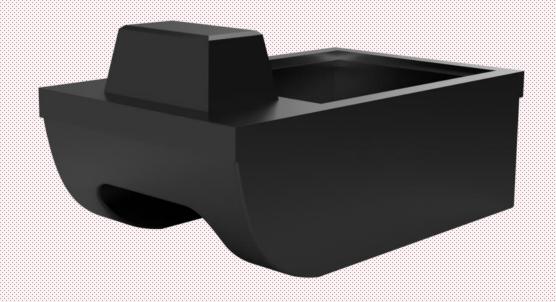
Critical Design Review

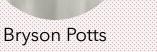


By: Tamara McCaskill, Joseph Earnest, Steven Harrington, Bryson Potts, Manning Owens

















Our Team

Our Goal

Demonstrate skills acquired through FSU-PC's Mechanical Engineering program by constructing a boat capable of meeting the 2021 RoboBoat competition standards.

Updated Project Plan

RoboBoat 2021 Completed! What next?

- Possible plans to assemble hull at Gulf Coast State College
- Integrate the electrical components
- Begin Testing

RoboBoat Has Passed

Technical Design Report

- ME and EE worked on separate
- ME handles hull design and design process
- EE handled electronic components
- Explained future of project

RoboBoat Has Passed

Skills Video

- Focused on hull design and design process
- Capability to highlight aspects visually
- Used prototype for reference

RoboBoat Has Passed

Website Link

- Updated existing SPEAR website
- New page for this year's team
- Plan to add more as the project progresses

Initial Requirements

- Design boat hull
- Fabricate boat hull
- Integrate electronic components
- Write code facilitating autonomous obstacle avoidance
- Have an autonomous boat capable of competing in the RoboBoat competition

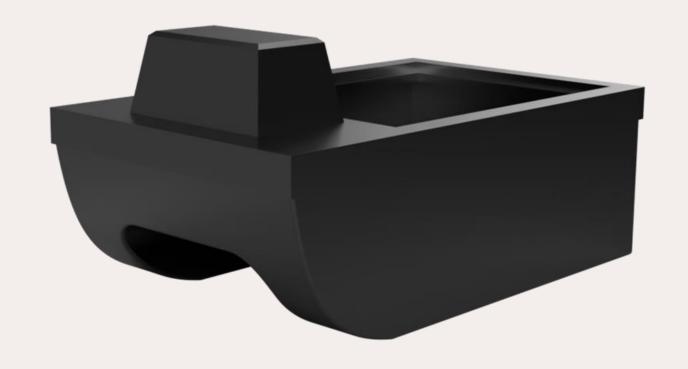
Revised Requirements

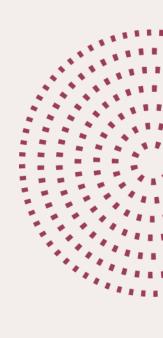
- Put finishing touch on hull design
- Fabricate hull
- Integrate electronic components
- Have an RC capable boat by end of semester



Meet B.O.A.T

(Best of All Time)







B.O.A.T

- Length is 1.2 meters
- Height is ~ .85 meters
- Material of construction is Carbon Fiber (contingent on Gulf Coast partnership)
- Weight estimate of Hull + Lid is 13.26 Kg or 29 lbs. (SolidWorks material estimate)

Prototypes

Hull

- Finalize a model to construct
- 3D print said model
- Observe how it sits in water

Lid

- Determine LiDAR tower size
- Finalize hatch size

LiDAR Tilt Mechanism

Create test mechanism

Propulsor Hot-Swap

Test making more propulsor hot-swaps

RoboBoat 2021

| Scale Factor 1/92.85 | Original Weight (g) | Scaled Weight (g) |
|-------------------------|---------------------|-------------------|
| Hull | 6,500 | 70 |
| Hull Lid | 1,000 | 10.76923077 |
| LiDar | 447 | 4.813846154 |
| Camera | 72 | 0.775384615 |
| GPS | 250 | 2.692307692 |
| Thruster (x4) | 624 | 6.72 |
| Computer | 200 | 2.153846154 |
| Battery (x2) | 1450 | 15.61538461 |
| Total Weight | 10,543 | 113.54 |
| Total Weight (lbs) | 23.24335526 | 0.250313057 |





The Hull

- 3D modeled in Fusion 360 for FDM 3D printing (1/16 volume scale)
- Printed in Hatchbox PLA filament
- Lead fishing weights used as the scaled components



The Lid

- 3D modeled in Fusion 360 for FDM 3D printing (1/16 volume scale)
- Printed in Hatchbox PLA filament
- Spacious hatch for easy access to electrical components

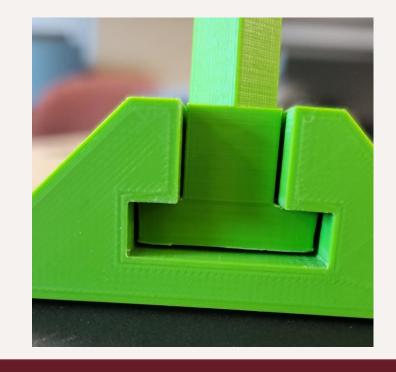


The Tilt Mechanism

• Designed to adjust the angle at which the LiDAR will sit on the boat

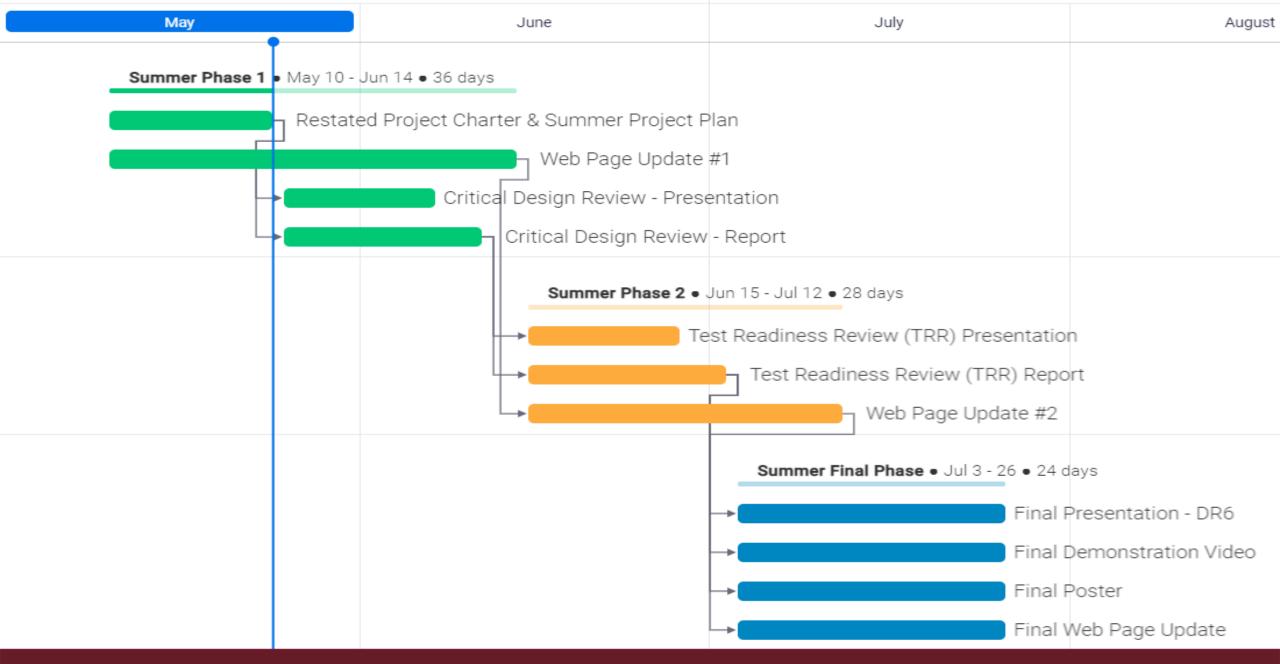






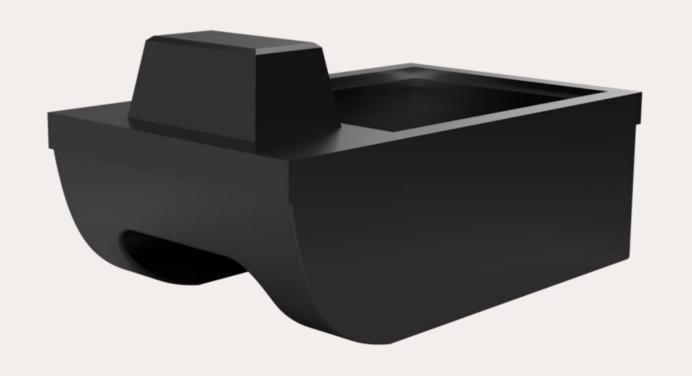
The Propulsion Hot Swap

- Allows for quickly interchanging the propulsors
- Also allows the boat to sit on the ground without being supported by the propulsors
- Recreate the model on hand to be 3D printed





Questions?





B.O.A.T

(Best of All Time)