Senior Design 524PC – RoboBoat

Bryson Potts, Joseph Earnest, Manning Owens, Steven Harrington, Tamara McCaskill
Florida State University Panama City

Objective

The goal of this project is to design and build a boat with autonomous function that can complete the course objectives for the 2021 RoboBoat Competition.

Rules and Requirements

The following bullets are the rules and regulations for the 2021 RoboBoat competition:

- The boat cannot exceed 140 pounds
- Boat must be no bigger than 6 x 3 x 3 feet
- Positive buoyancy
- The boat must be battery powered
- Vehicle must be fully autonomous and remote controllable
- All sharp/pointy, moving and sensitive parts marked and covered
- Have 3 or 4 deployment hooks and a tow hook
- Have on-board and wireless kill switch

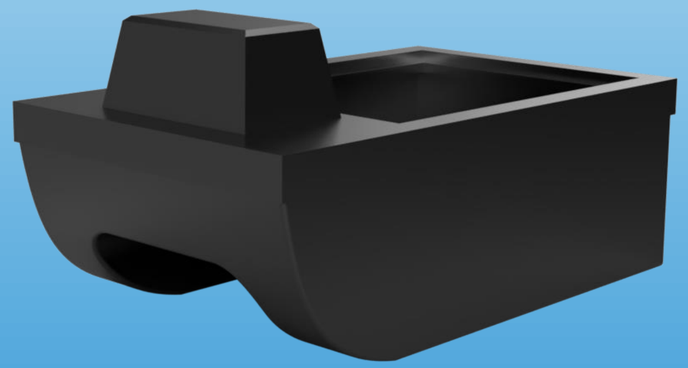
Targets

The following are targets that we aim to achieve in the design and engineering of our boat:

- Positive buoyancy for run length
- Center of gravity below center of buoyancy
- Detect all objects within 6 meters
- The boat have a thrust of 13-18 lbs

Design

- Catamaran Hull Style
- E6 Fiber-Glass for Hull material
- Permanent Lid with hatch for component access
- Component tower for cooling and electronics placement

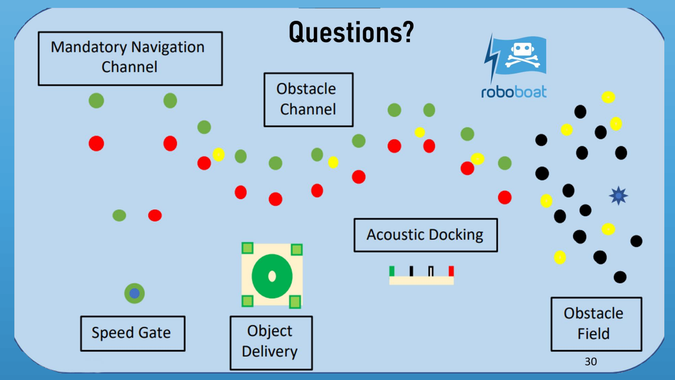


Future Work

- Fabrication of the Boat Hull
- ME Team will collaborate with EE Team to integrate electrical components into final design.
- Video of Hull design process will be made.
- Project will be submitted for the RoboBoat competition by Sunday May 23.
- Final presentation will be presented by team during Summer.

Prototype

The hull prototype CAD models were ran through flow simulation and a final model was selected to be created on a small scale. It was 3D printed using PLA filament at a 1/16 scale. The component weights were scaled down and using small scale weights the representative component distribution was made on the 3D printed model. It was able to achieve the desired stability, we are confident that the full scale boat will work as expected based on the prototype results.



Advisors

Dr. Damion Dunlap- Mechanical Engineering Assistant Teaching Professor

Dr Patrick Walters- NSWC PC Scientist