

## Underwater “tire” Robot

### Team:

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### Sponsor:

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### Client:

Dr. Stephen Wood [swood@fit.edu](mailto:swood@fit.edu)

### Goal and Motivation:

Produce software as a controller for an Autonomous Underwater Vehicle. This vehicle will be able to survive without human interference and collect sensitive data while maintaining anonymity. This AUV will collect and synchronize data based on our pre-programmed survey and sampling schedule. The AUV will remain underwater, navigate coastal regions, collect data using neural networks in conjunction with embedded sensor systems. We will work on the navigation and some sensory input of the vehicle.

### Features:

- 1) The Underwater vehicle will have an autonomous controller to navigate to target destination while maintaining a mission planner.
- 2) This vehicle will collect input from multiple sensors in order to receive data to store and analyze until there is a scheduled transmission.
- 3) The vehicle will avoid collision, prioritize self-preservation, and have an emergency system in place.

### Novel features:

An autonomous underwater vehicle that can survive, navigate, and monitor harbors without being detected. This vehicle will collect data from multiple sensors and transmit to a satellite uplink.

### Technical Challenges:

- 1) Learning how to use MOOS (Mission Oriented Operating Suite)
- 2) Building simple artificial intelligence for the vehicle to survive without user dependency
- 3) Understanding and programming the hardware, including data gathering and sensor synchronization.

**Milestone 1: (Oct 3)**

- Collecting information on hardware IO during week of September 4, 2016.
- Investigate and learn to use MOOS starting September 2, 2016.
- Create Requirement Document, start week of September 4, 2016.
- Create Design Document, start week of September 4, 2016.
- Create Test Plan

**Milestone 2: (Oct 31)**

- Implement, test, and demo GPS navigation controller
- Implement, test, and demo AUV dead reckoning
- Implement, test, and demo motor control

**Milestone 3: (Nov 28)**

- Implement, test, and demo sensory input
- Implement, test, and demo collision avoidance system
- Implement, test, and demo data transmission

**Task Matrix:**

Task	Taylor	Robert	Clayton	Sean
Investigate/Select Tools	Hardware formatting	Pathfinding Alg	MOOS	MOOS
Demo/Examples	Formatting examples	GPS navigation	Hardware control	Data visualization
Requirement Document	Write 40%	Write 20%	Write 20%	Write 20%
Design Document	Write 20%	Write 40%	Write 20%	Write 20%
Test Plan	Write 20%	Write 20%	Write 30%	Write 30%

“I have discussed with the team and approved this project plan. I will evaluate the progress and assign a grade for each of the three milestones.”

Signature: \_\_\_\_\_ Date: \_\_\_\_\_