

Team sddec20-06  
EE 492  
31 August 2020  
Batteryless, Encapsulated Hydrometer

Bi-weekly Status Report #1 [B1]

### Individual Contributions:

Name	Contributions to the team	Hours Worked for the Week	Total Cumulative Hours
Tilden Chen	Orientation Detection	10	10
Josh Hall	Base Station Software	10	10
Jensen Mayes	Mechanical Prototype Work	10	10
Chris McGrory	Mechanical Simulation Model	10	10
Griffin Orr	Schematic Design/PCB Layout	10	10
Chris Pedersen	Orientation and Code Development	10	10

### Summary:

In the past two weeks, we got started with the semester and refreshing where we are at with the project. We all met and were able to get up to speed on our progress and lay out a schedule for the semester. We were also able to make some progress on building up a simple mechanical prototype from PVC for testing the tilt mechanism with a development board.

### Individual Contributions

- Griffin Orr
  - Over the past few weeks I have reviewed the schematic that I made last semester and over the summer as well as updated some of the component values. Currently, the schematic includes all of the hardware except the energy harvesting module and antenna. These will be added over the course of the next two weeks.
- Chris McGrory
  - In the past week I have developed a modular simulation environment for the hydrometer. The design will help us test the physical equations, developed by Jensen Mayes and Chris Pederson, that convert the cartesian output from the accelerometer to equate liquid density. We will be using the Thunderboard Sense 2 microprocessor to test these equations because it runs off the same MCU as the one in our custom PCB for the final design.

- Josh Hall
  - I have been getting back into the groove of things and reviewing some of the code I wrote last semester. I will be working on getting the base station to receive Bluetooth beacons and talk with Chris and Tilden about what implementation method we will use for the beacon.
- Christopher Pedersen
  - I have been working on the code for orientation and looking at the Thunderboard Sense 2 programming documentation. I have also been reviewing the orientation calculations.
- Jensen Mayes
  - I have been working on planning for the majority of the past 2 weeks and have set out a semester long work schedule with the major tasks in a spreadsheet. I was also able to meet with Chris M. to get the materials for the PVC Prototype and I assembled the development board that will be used for testing in the PVC prototype until our board is finished and working.
- Tilden Chen
  - I have been working with the IMU and going through code to determine orientation. Next step will be encoding that information in Bluetooth beacon and transmitting it to the base station.

#### **Pending Issues:**

- Getting access to the needed lab equipment (Reflow oven)
- Determining how to continue project process with limited in person contact

#### **Plans for Next Week:**

- Verify Kinematic Equations for finding tilt angle.
- Figure out Equipment Access abilities
- Test the PVC Mock-Up Platform in a container of some sort to determine how it reacts
- Begin adding symbols for the energy harvesting module to the schematic