Dwight Look College of ENGINEERING
TEXAS A&M UNIVERSITY

Team 05: Smart Luggage
Bi-Weekly Update 5

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Project Summary

Problem statement:

- Luggage can be a challenge for elderly and disabled people due to the luggage weight.
- Luggage are subject to theft or loss.

Smart Luggage will:

- Follow the user and alert them if the luggage is out of range.
- Avoid Obstacles.
- Allow the user to locate their luggage in the event of theft or loss using a phone application.

Project Timeline

Update 1
8/29/22

Completed

- Movement and Obstacle avoidance 100% complete.
- Phone App 100% complete.
- Tracking and navigation 100% complete.

Update 2
9/12/22

Completed

- Calculate tag position.
- Obtain rover coordinates on phone app.

Update 3
9/26/22

Completed

- Command rover based on (x,y) values.
- Transfer tag position.
- Update rover location on phone app.

Update 4
10/13/22

Completed

- Final Integration.

Update 5
10/24/22

In Progress

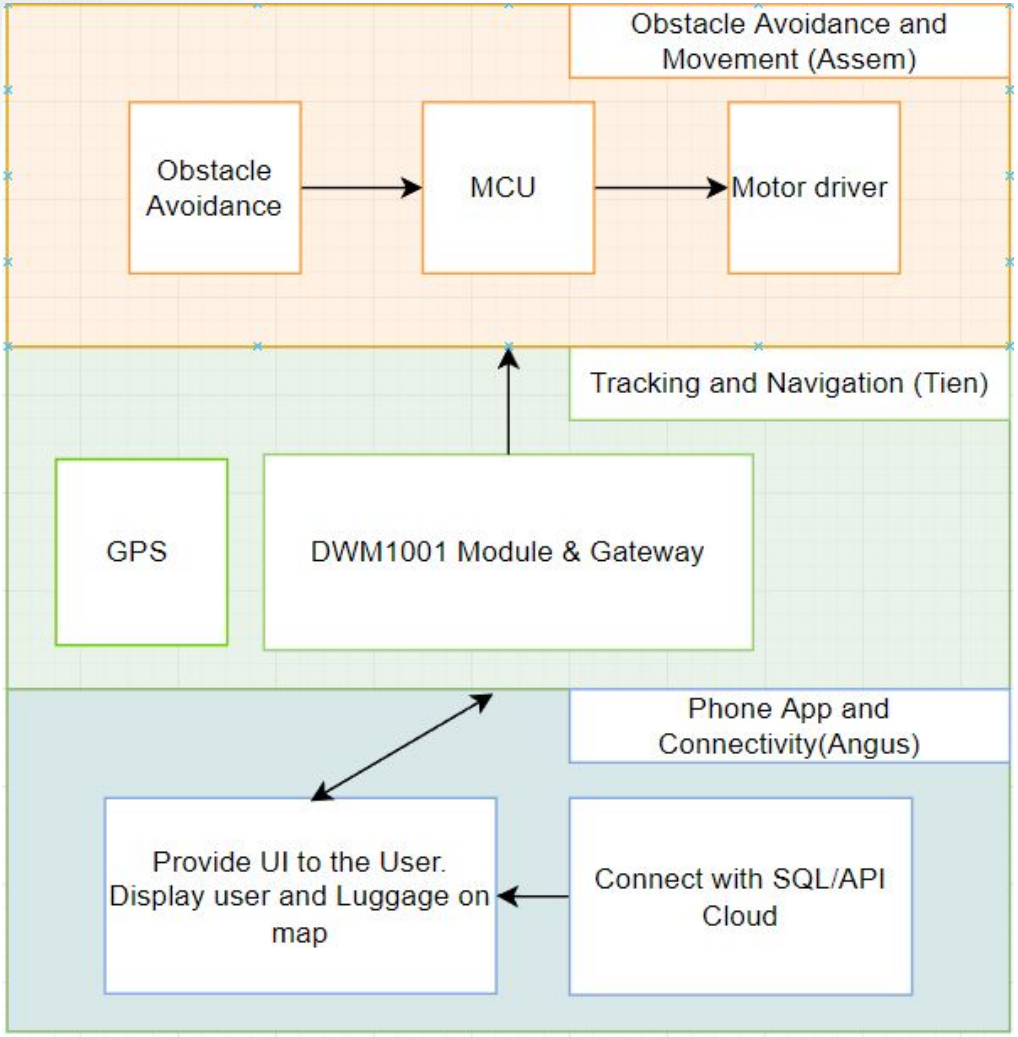
- System Validation.

Final
11/14/22

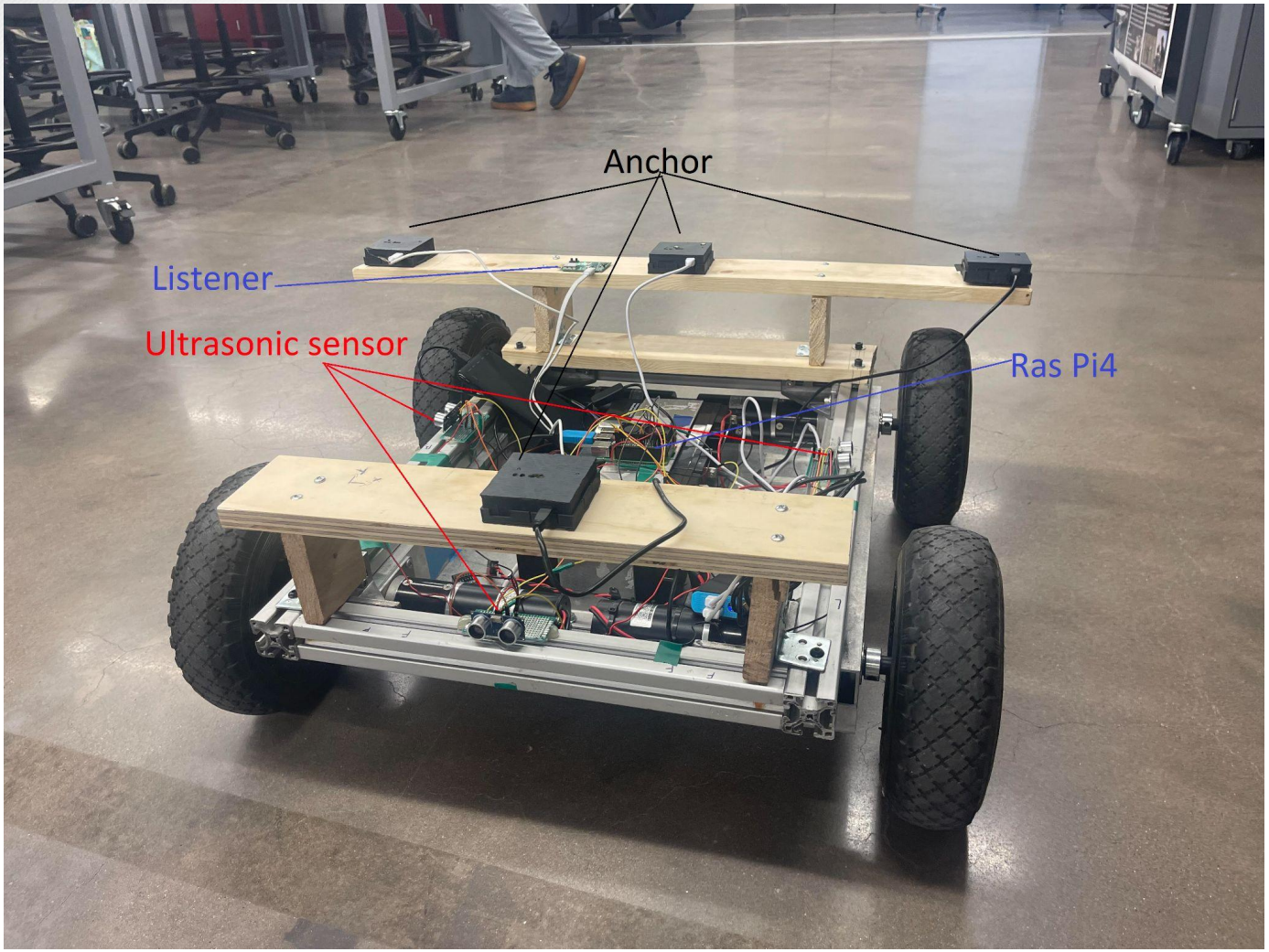
Not Started

- Design Presentation.
- System Demo.
- Showcase Video.
- Final Report.

Project/Subsystem Overview



Project/Subsystem Overview



Movement and Obstacle Avoidance

Assem Abdelkhalek

Accomplishments since Status Update 4 24 hrs of effort	Ongoing progress/problems and plans until the next presentation
• Fully integrated the movement and obstacle avoidance with the tracking subsystem. • Implemented a fail-safe solution to prevent the rover from going out of control. • Performed an overall validation for the system.	• Continue to perform further validation and optimization to the system.

Demonstration Video

Tracking and Navigation

Tien Le

Accomplishments since status update 4 24 hrs of effort	Ongoing progress/problems and plans until the next presentation
• Finished setting the hardware with anchors, tag & gateway. • Collected and calculated the distance between the tag to each anchors and tag position as x, y coordinate. • Verified the correct distance and cleaned the data. • Provided GPS data for the phone app. • Sent data to Movement subsystem.	• Validation between the navigation module and infrared sensor.

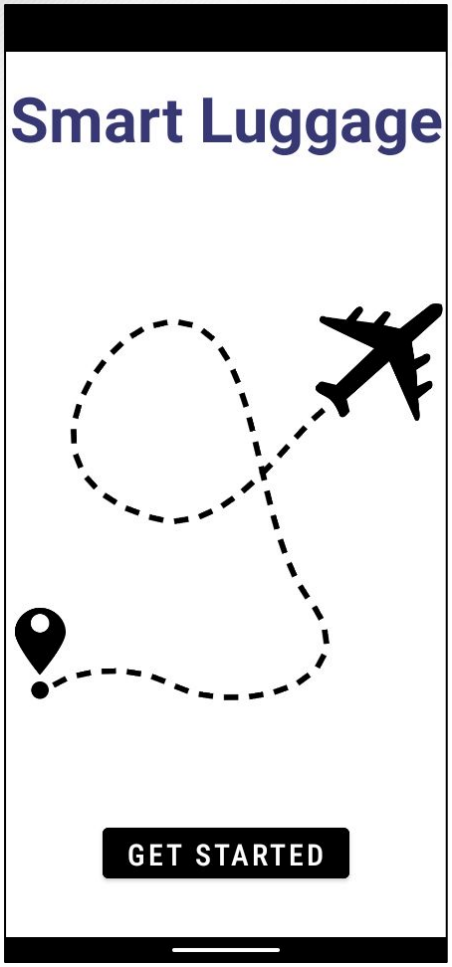
Phone App

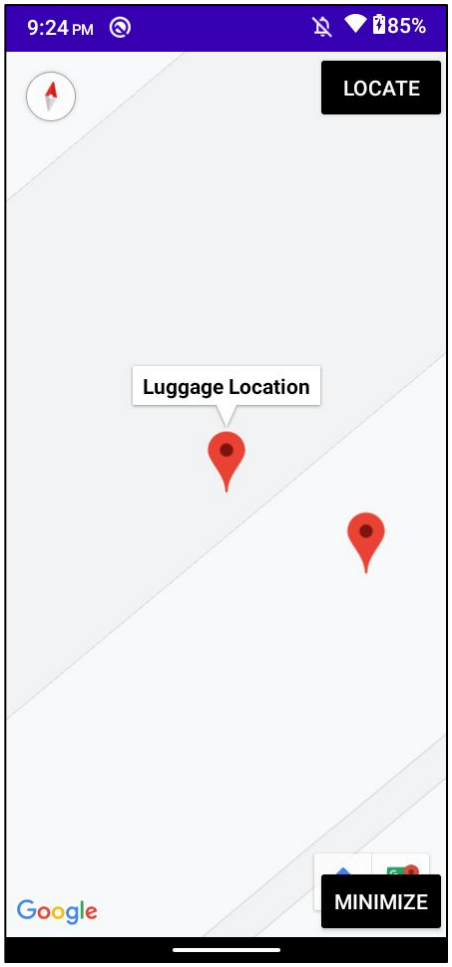
Angus Mckellar

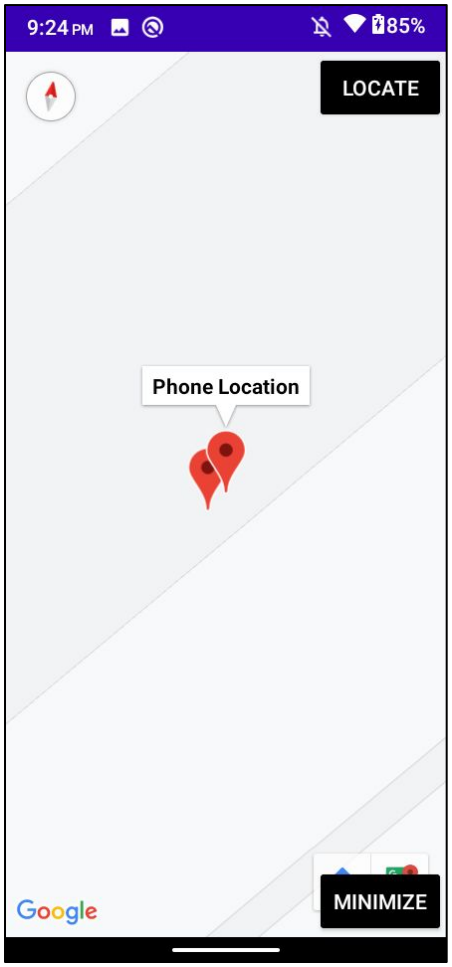
Accomplishments since status update 4 20 hrs of effort	Ongoing progress/problems and plans until the next presentation
• Successfully obtain latitude and longitude of raspberry pi on the phone. • Able to display the location of the luggage on the map along with the users location.	• Continue to optimize and validate app to create the best user experience. • Help with the validation of other subsystems.

Phone App

Angus Mckellar







Phone App

Angus Mckellar

```
Your position: lat = 30.584408, lon = -96.3391299
192.168.1.24 - - [23/Oct/2022 21:23:55] "GET / HTTP/1.1" 200 -
192.168.1.94 - - [23/Oct/2022 21:24:03] "GET / HTTP/1.1" 200 -
Your position: lat = 30.5844088, lon = -96.3391298
192.168.1.94 - - [23/Oct/2022 21:24:14] "GET / HTTP/1.1" 200 -
192.168.1.94 - - [23/Oct/2022 21:24:25] "GET / HTTP/1.1" 200 -
Your position: lat = 30.58441, lon = -96.3391294
192.168.1.94 - - [23/Oct/2022 21:24:36] "GET / HTTP/1.1" 200 -
192.168.1.94 - - [23/Oct/2022 21:24:47] "GET / HTTP/1.1" 200 -
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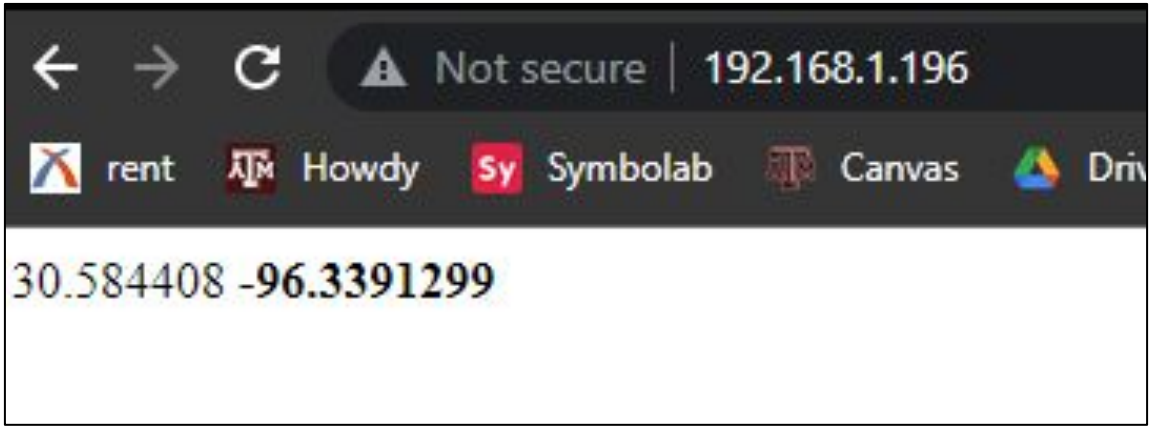
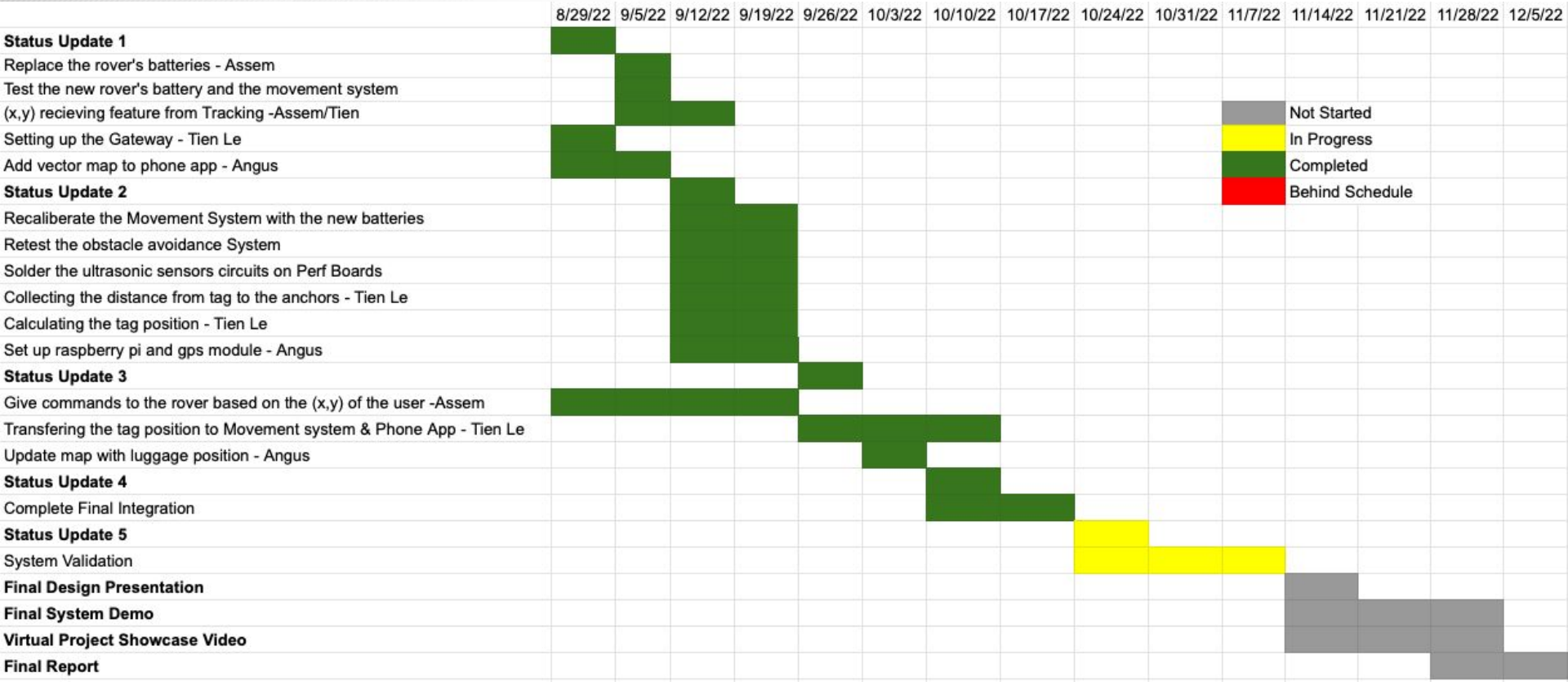


Execution Plan



Validation Plan

Test Name	Success Criteria	Methodology	Status	Passed/Failed	Responsibility
Retest the movement system with the new batteries	Consistent movements of the rover given the same commands	Send different commands to the motor driver and observe the response of the rover	Tested	Passed	Assem Abdelkhalek
Test the re-calibration of the movement and obstacle avoidance with new batteries	Getting the desirable speed and rotational angle of the rover	Change the timing and speed of the rover and observe for consistency	Tested	Passed	Assem Abdelkhalek
Test the ultrasonic sensors after being soldered on Perf Boards	Circuit is functioning	Check for shorts and discontinuities & check that I receive the correct distances from the sensors by RPI	Tested	Passed	Assem Abdelkhalek
Test the response to the (x, y) coordinates	The program shall be able to give the right command depending on the coordinates	Test and debug until we get the desirable result	Tested	Passed	Team

Validation Plan

Test Name	Success Criteria	Methodology	Status	Passed/Failed	Responsibility
Vector Map	Successfully display users journey as a vector map	Walk around a large area on campus with wifi coverage in order to see if map display a polyline of the journey	Tested	Passed	Angus Mckellar
Phone and Raspberry pi communication	Successfully connect with the raspberry pi from the phone	Utilize wifi in order to connect with each device and attempt to send data across the connection	Tested	Passed	Team
Coordinates	Obtain the coordinates of the raspberry pi on the phone	Successfully obtain the raspberry pi coordinates and save them in a variable on the phone app	Tested	Passed	Team
Luggage on map	Display both the user and luggage location on map	Upon launching phone app be able to see a marker representing both the user and luggage	Tested	Passed	Team

Validation Plan

Test Name	Success Criteria	Methodology	Status	Passed/Failed	Responsibility
Collecting the data from tag and anchor	Showing the tag location with x,y,z coordinate	Moving the tag around the anchors	In Progress	In Progress	Team
Processing the data and calculating the distance from tag to the anchor	Get the right distance and the position of the tag compare to the robot	Changing location of the tag, verifying the distance with real measurement	In Progress	In Progress	Team

Parts Ordering Status

Part Description	Status (order approved/order placed/part received)
Rover Batteries	Received
Power Bank	Received
Sounds Buzzer	Received

Thank you!
Questions?