

CprE / SE / EE – sddec26-11

CyFlyBot: Collaborative CyBot and UAV System for Faster Missions

Status Report 2

September 9 2026 – September 23 2026

Client: Dr. Rover and Dr. Jones

Faculty Advisor: Dr. Rover and Dr. Jones

Team Members:

Daniel Bieber

John Brittain

Jake Nickel

Caleb Sanchez

Tu Reh

Ping Wu

Mitchell Fowler

Weekly Summary

Week 1: This week's big theme was the team having its first faculty meeting. Hardware and Software both continued with production in their areas, with the line between the two getting blurred thanks to a focus on the ROS2 node integration. Hardware has been meeting semi-daily to continue work on the UGV. There's been minor hiccups with setting up the UGV and it's LiDAR, but progress is being made. Raspberry Pi Integration has also been a focus. Software has been making strides in UAV simulation as well as frontend and backend development for the HQ. UAV simulation is at a functional level while the whole team is fully tooled for UGV simulation. Databases and Login interfaces have been made for the HQ as well.

Week 2: This week had a slight slowdown in production due to the team needing to prep for the career fair. There was no general meeting, but each member had their assigned tasks and was able to complete them sufficiently. Hardware made progress in the UGV and UAV

construction, with the UGV further incorporated with the Raspberry Pi and UAV only needing the additional boards. Software made progress with the backend and frontend development, with camera feeds being integrated on both sides and ArUco markers being prepped for integration.

Past Two Weeks Accomplishments

- Software(Week 1)
 - Further integrated Nav2 with Pathfinding
 - UAV simulation started and functional
 - Team fully updated on ROS2 and Gazebo simulations
 - Frontend Development started with Login Interface and React Dashboard
 - Backend Development with database made
- Software(Week 2)
 - Frontend
 - Revised based on faculty feedback
 - Connected to Ros2 simulation
 - Backend
 - Formatted for ArUco camera feed
 - Websocket created for camera display
 - Issue Board
 - Start Trigger Issue worked on
- Hardware(Week 1)
 - UGV 3D Model made for simulation purposes
 - UGV landing pad modeled and 3D printed
 - Raspberry Pi 3 acquired for on-board docker simulation
 - UAV 30% assembled
- Hardware(Week 2)
 - UGV
 - Raspberry Pi fully flashed
 - UAV
 - Fully constructed out of box
 - 3D model compiled and uploaded to Git
 - Imaging Deck Prototyped

Individual Contributions:

NAME	Contributions	Bi-Weekly Hours	Total Hours	Attended General Meeting
John Brittain	-3D printed landing pad -Assembled Ground Bot	8	15	yes

	-Researched ROS2 integration -Created weekly presentation slides -UGV Raspberry Pi Flashed with Ubuntu Server -Imaging Deck prototyping			
Daniel Bieber	-Developed a 3D model of the UGV with landing pad for use in simulations. -Researched for files with components for a UAV model. -Created UAV Model for Simulation Purposes	11	19	yes
Jake Nickel	-Finalized Webots investigation -Caught up on the gazebo simulation and running to the point of the rest of the software team. -Started work on the start trigger issue for mapping -Worked on Start Trigger Issue for UGV	9	17	yes
Caleb Sanchez	-Integrated Nav2 with Pathfinding -Formatted ArUco camera feed for backend -Created websocket in backend to display camera feed	13	25	yes
Tu Reh	-Worked on Cyflybot Frontend -added React Dashboard and Login Interface -connected Frontend to FastAPI -revised frontend based on faculty feedback -connected front end to ros2 simulation	11	18	yes
Ping Wu	-Created Database for backend -Researched Translating Camera Feeds from Hardware to Software -Worked on receiving camera feed from simulation -successfully got backend to fetch camera feed	8	15	yes
Mitchell Fowler	-Report/Clerical/Management -Hardware and Software Node Integration Research -UAV Building	11.5	22.5	yes

	-Researched Warehouse Management systems per Dr. Rover's request			
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General Meeting Review

Meeting 1: The general meeting was held on Tuesday, May 15th, at 2:00 p.m. The focus was reworking the Instructor Review Reflection to be up to a higher standard. We followed the critiques provided in the weekly advisor meeting in the first half of the meeting. In the second half, reporting was discussed as well as weekly tasks.

Meeting 2: There was unfortunately no general meeting this week, as the Engineering Career Fair occurred exactly during the time of our meeting. We all prepped for this and were all clear on our tasks for the upcoming week.

Summary of Weekly Advisor Meeting

Faculty Meeting 1: This was our team's first meeting with Dr. Rover and Dr. Jones this semester. We met at 3:45pm until 4:30pm on Thursday, September 10th. Firstly, we discussed the Reflection for the Instructor Review. Our wording needed improvement as it felt as though it was written by only one person instead of the whole team. Along with this, it was too generalized and didn't have enough detailed information. There were also some formatting issues that needed to be improved upon. After this, we discussed our current progress. Dr. Rover emphasized the need for urgency, as last semester took us until week 5 for full speed. It was also noted that going forward, we need to keep an updated systems diagram for use by the Advisors. All of this was taken into account and will be worked on in the following week.

Faculty Meeting 2: The weekly advisor meeting was successful with feedback being provided by the advisors. Some of the issues that were brought to light were as follows: 1) Provide a live video feed as a demo for the frontend 2) Improve naming conventions and scalability 3) Improve Layout 4) Fix Hardware Diagram 5) Improve coordination between hardware and software diagram 6) Incorporate last semesters diagrams.

Extended Discussion

Week 3: This was a week of full speed. Previous weeks were dedicated to getting up to speed, but now the team is familiar with our tools and processes. All members now have

some sort of ROS2 system on their personal computers for use. Software is making great progress on their different aspects and will continue to do so. Hardware is struggling a bit with the UGV construction as minor issues keep impeding progress like too short of cables being provided or tutorials being outdated and incorrect.

Week 4: The career fair really threw a wrench into progress this week. Each member had 5 or more less hours to work with this week to dedicate to the project. However, this is better than the alternative, as ignoring the Career Fair would have been putting the cart before the horse. In any case, both hardware and software were able to accomplish goals and make use of the time available to each of us.

Pending Issues

- Hardware
 - New UPS board
- Software
 - Mapping Start trigger
 - Issues Board

Plans for Coming Weeks

- Whole Team
 - Return to regularly scheduled meetings
 - Return to average of 6 hours of work
 - Complete Instructor Review Meeting
- Hardware
 - Continue UGV testing and building
 - Bring UAV to functional level
 - Continue node integration work
- Software
 - Continue Frontend development
 - Continue Backend development

Resources and Documentation



Figure 1: Updated 3D UGV model with landing Pad

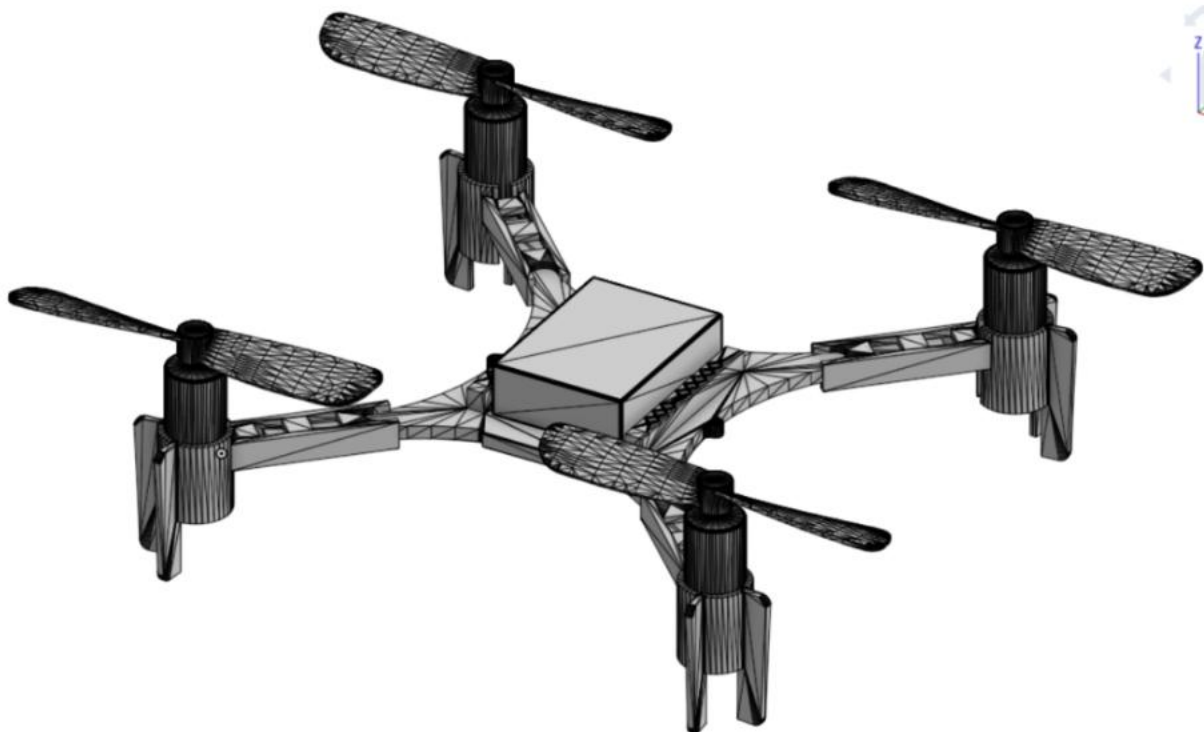


Figure 2: Initial UAV 3D Model

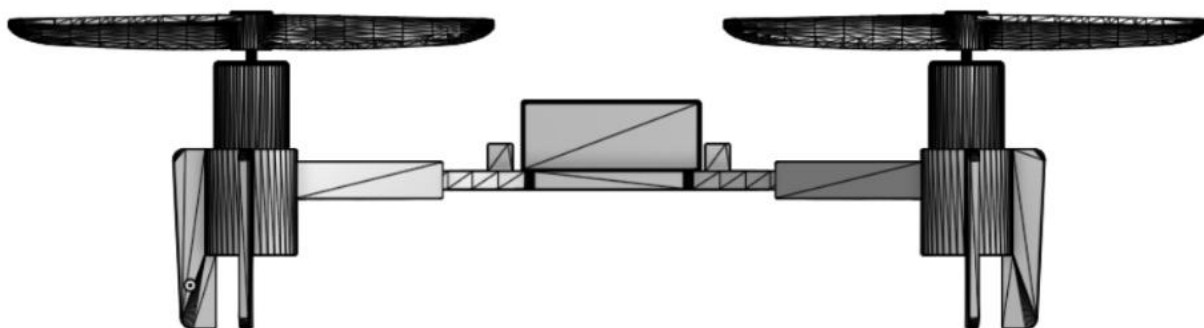


Figure 3: Initial UAV 3D Model(sideview)

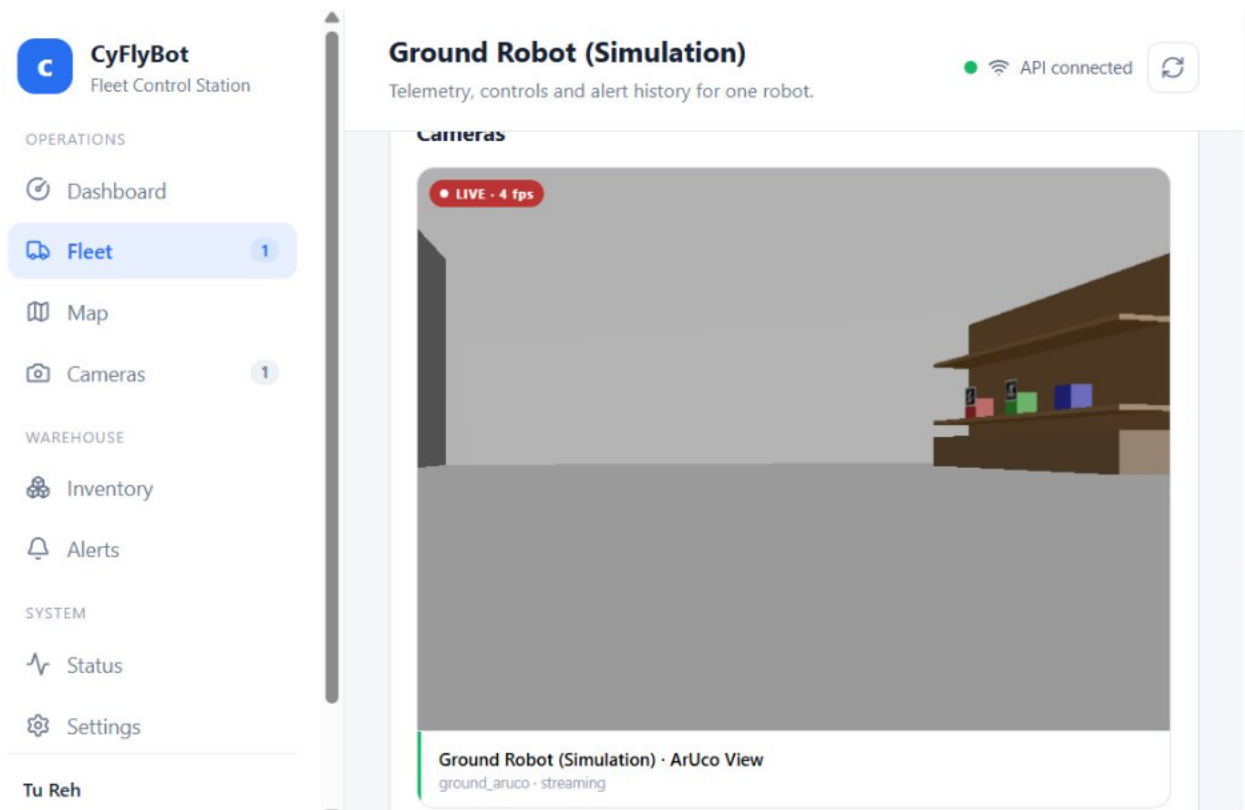


Figure 4: Updated Frontend

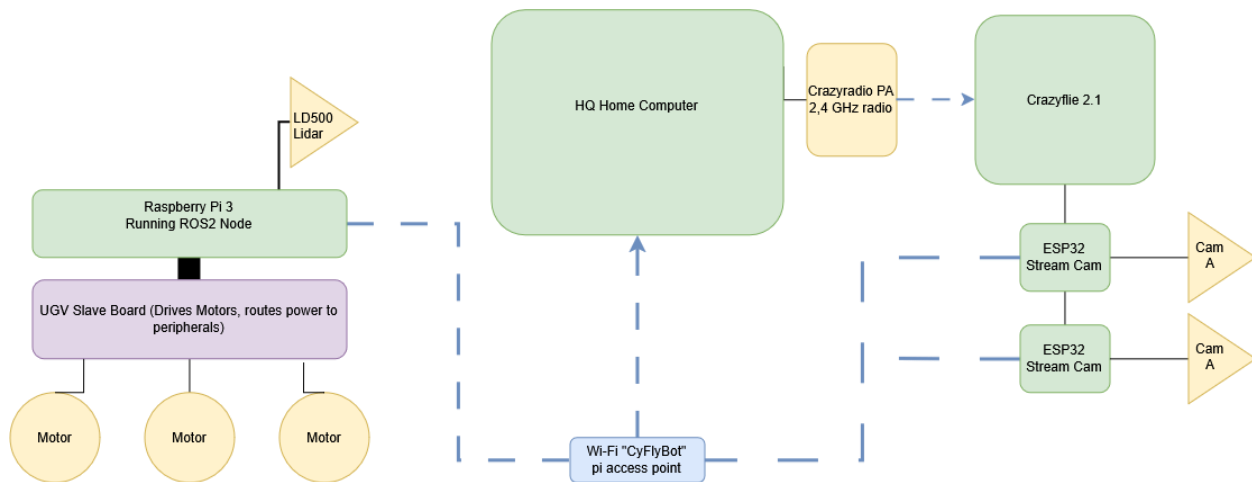
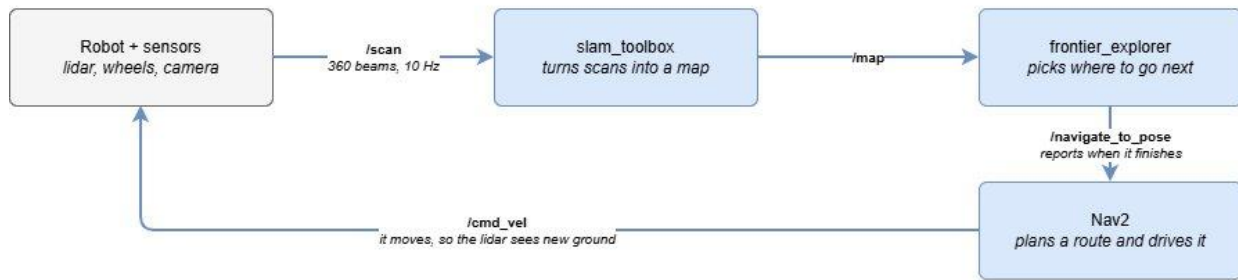
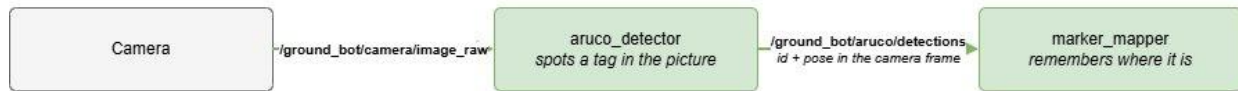


Figure 5: Initial Hardware Systems Diagram

1 · Build the map: this loop runs until the warehouse is covered



2 · Find the markers: happens while the robot drives around



3 · Send the drone: once the map and the marker list exist

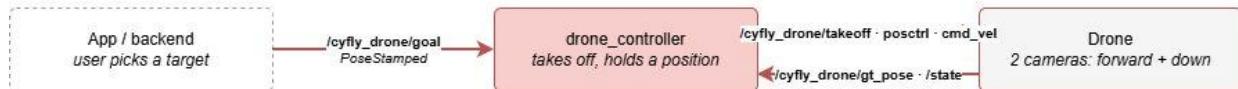


Figure 6: Initial Software Systems Diagram