

CprE / SE / EE – sddec26-11

CyFlyBot: Collaborative CyBot and UAV System for Faster Missions

Week 9 Report

April 15th 2026 – April 23rd 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

This week saw a slowdown in work, but with the average still being around 6 hours per student as recommended by Dr. Rover. Focus was placed on the upcoming presentations during meetings. There will be a Lightning Talk over Ethics on April 28th and the Faculty Panel Review on May 4th. Software made sure Gazebo/ROS2 simulations were refined and improved. Hardware worked on UAV troubleshooting, with progress made on getting the available boards working. Individuals worked on their dedicated topics.

Past Week Accomplishments

- Design Documents
 - Team Approach master diagram created
 - Refined ROS2 diagram
- Software
 - Gazebo Simulations
 - Worked on slam_toolbox testing in simulations
 - Added LIDAR to the groundbot for testing
 - Set up Environment
 - Integrated ArUco tags
 - Fixed UGV model
- Hardware
 - CyBot/UGV
 - Derived equations for wheel velocity when turning with differential drive
 - Found Implementations of differential drive controllers with ROS2
 - Created code composer project for CyBot ROS2 testing
 - CyBot Alternative
 - Derived equations for wheel velocity when turning with differential drive
 - Progress made on Psuedo Programming commands
 - CrazyFlie/UAV
 - Lots of troubleshooting
 - Got multiple boards working while using the program
- Administrative
 - Successful Meetings
 - Created generalized term documentation
 - Started Bill of Materials
 - Presentations
 - Lightning Talk
 - Discussed content
 - 80% done with power point
 - Practiced individual parts
 - Faculty Panel
 - Discussed general format

Individual Contributions:

NAME	Contributions	Weekly Hours	Total Hours	Attended General Meeting
John Brittain	- Created code composer project for CyBot ROS2 testing (1 hour) - Worked on Lightning Talk Presentations (2 Hours) - Attended Meetings (Advisor, General, Hardware) (4 Hours)	7	35.5	Yes
Daniel Bieber	- Found implementations of ROS2 with differential drive controllers (1 Hour) - Derived equations for wheel velocity when turning with differential drive (1 hour) - Attended Meetings (Advisor, General, Hardware) (4 hours)	6	31.25	Yes
Jake Nickel	- Worked on/ Practiced Lightning Talk (0.75 hours) - Started working on slam_toolbox testing in simulation and added LIDAR to the groundbot just for testing(2 Hours) - Attended meetings (Advisor, General, Software)(3 Hours)	5.75	30.5	Yes
Caleb Sanchez	- Integrated ArUco tags into gazebo sim (2 Hours) - Fixed UGV model with 4 wheels instead of two (1 Hour) - Completed High Level diagram (30 minutes) - Attended Meetings (General, Software)(2 hours)	5.5	34	Yes
Tu Reh	Set up environment for simulation(1 Hour)	5	30.25	No(Excused)

	- Experiment with Gazebo simulation(1 Hour) - Attended Meetings (Advisor, General, Software) (3 Hours)			
Ping Wu	- Finished ROS 2 design diagram - Worked on getting the simulation setup with gazebo - Met up with team to work on lightning slides and prepare	3	27.5	Yes
Mitchell Fowler	- Worked on Lightning Talk Presentation(30 minutes) - CyNot Psuedo Programming (30 minutes) - Report 9 Writing (1.5 Hour) - Attended Meetings(Advisor, General, Hardware) (3 Hours)	5.5	37.25	Yes

General Meeting Review

The general meeting occurred again at SIC 3131 from 4-5pm on Monday, April 20th. Almost everyone was present, with the only absentees alerting the team ahead of time.

Discussions were had on the wave of upcoming presentations including, the weekly advisor meeting, the lightning talk presentation, as well as the Faculty Panel Review. We found there were a lot of crossovers between the topics, along with what work is left for each member. General goals for the week were given to individuals with a priority on presentation prep.

Summary of Weekly Advisor Meeting

The weekly advisor meeting was moderately successful. A presentation on hardware's recent progress was given. Proposals were given for the Cybot alternative with moderately positive reactions. The reason for the proposal was ease of access when interacting with the other components in the lab versus the Roomba/Cybot. More work will need to be done to improve feasibility. Along with this, research on capacitive charging was presented and how it would not be a way forward for the drone. Minor simulations were presented as well with a recommendation for Webots given to run simulations going forward. A variety of advice was given that we followed.

Extended Discussion

This week was the first week we as a team felt out of the “danger zone”. Our course correction was around a month ago and have managed to hit a stride in progress. The upcoming presentations are a looming challenge that will test our mettle. Having to balance a well-prepared presentation without losing our rate of progress in the project will take everything we have.

Pending Issues

- General
 - Unfinished Design Document
 - Unfinished Lightning Talk Presentation
 - Unfinished Faculty Panel Presentation
- Hardware
 - Need to complete Psuedocode for the CyBot, CyNot, and CrazyFlie.
 - Get ROS2 working on CyBot, CyNot, and CrazyFlie
- Software
 - Get Slam_toolbox working
 - Experiment with WeBots
 - Integrate crazyswarm into gazebo

Plans for Coming Week

- Hardware
 - Daniel Bieber
 - Write out psuedo code for command parsing for UGV
 - Document command format for UGV
 - John Brittain
 - Create a state diagram for high level hardware design
 - Finalize design for custom imaging deck
 - Get CyBot running ROS2
 - CrazyFlie drone in simulation
 - Mitch Fowler
 - Finalize Lightning Talk Presentation
 - Prepare Faculty Panel Presentation
 - Get CyNot running ROS2
- Software
 - Jake Nickel
 - Lightning Talk Preparation

- Try to get slam_toolbox figured out on the simulation
 - Work on Final Presentation
- Caleb Sanchez
 - Integrate crazyswarm into gazebo to begin drone simulation
 - Add more topics if possible
 - Work on Final Design Document
- Tu Reh
 - Lightning Talk Preparation
 - Experiment with WeBots simulation
 - Work on Final Design Document
- Ping Wu
 - Experiment with simulating drone movement
 - Finish lightning talk slides
 - Work on Final Design Document