

EE/CprE/SE 4920 WEEKLY REPORT 2

Report Details:

Timeframe: 2/5/2026 - 2/12/2026

Group number: 21 (*sdmay26-21*)

Project Title: A Smart Aquatic Ecosystem

Client &/Advisor: Md Maruf Ahamed

Team Members/Role:

Griffin Urban — Frontend Developer

Daniel Pender — Hardware

Aden Koziol — AI Population Tracking

Ryan Holden — Backend/Frontend Developer

Marina Mannan — Embedded Systems Engineer

Carson Irving — Backend/Frontend/AI

Max Purvis — Hardware

Weekly Summary

This week, the team made great progress towards having a physical fish tank. The hardware and embedded systems team met to fit the 3D-printed lid and obtain additional measurements for the camera mount. Additionally, the team has purchased and worked on creating the housing for the automatic feeding component. On the software side, the team has cleaned up the code across the board, worked on user authentication and security, and refined the system architecture.

Past Week Accomplishments

- **Aden:** Started working on a testing tool that will use the functionality of the API and population tracking scripts, where I can test accuracy locally. This way, I can start making adjustments using background subtraction and fine-tuning.
- **Marina:** Tested the lid on the fish tank and looked into adhesives. Discussed the placement of components on the lid and planned modifications. Also, continued designing the camera mount with a better idea of its physical size and tank constraints.
- **Carson:** Tied feed and image objects to the userId and updated their controllers and tests to reflect. This way, users will only have access to their own information in the database. Discussed with Marina, Max, and Danny about the tank setup, lid, camera holder, and feeder.
- **Max:** I discussed some of the tank architecture with the team. I made some changes to the pH sensor calibration code to better align with the actual behavior of our pH probe rather than the factory defaults. I also recalibrated the dissolved oxygen sensor because it had been left idle for quite some time, causing the calibration parameters to drift. I also implemented fault-detection software for the sensors in the Arduino code.
- **Danny:** Worked with team members to brainstorm ideas for the feeder mounting system and feed holder design. Completed the first on-paper design to begin prototyping. Also, I have begun modelling the feed holder in Fusion 360
- **Ryan:** I worked on creating documentation for our backend API classes. I completed the

comments and documentation for almost all of the controller classes.

- **Griffin:** Spent time testing the user account page and varying user levels (user, guest, admin), but have yet to push changes. Worked more on the frontend software diagram.

Individual Contributions

<u>NAME</u>	<u>Individual Contributions</u> (Quick list of contributions. This should be short.)	<u>Hours this week</u>	<u>HOURS cumulative</u>
Aden	• Worked on developing a testing tool	7	17
Marina	• Tested the lid's fit on the tank with the group • Discussed and made changes to the camera mount design	6	16
Carson	• Updated a couple of objects, controllers, and tests to include the userID field to tie data to users • Discussed future plans for lid, camera holder, and feeder with Danny, Marina, and Max	5	17
Max	• Discussed tank architecture with the team • Updated pH sensor calibration code • Updated DO sensor calibration parameters • Implemented fault detection for the sensors	8	12
Danny	• Talked through current design plans with Carson, Max, and Marina • Finalized the first design and have begun modeling on Fusion 360	7	14
Ryan	• Created documentation for controller classes	7	12
Griffin	• Worked on the user accounts page • Worked on cleaning up frontend code • Worked on user-level powers	7	13

Pending Issues

- N/A

Comments and Extended Discussion

- N/A

Plans for Upcoming Week

- **Aden:** Finish the testing tool.
- **Marina:** Make the Arduino box bigger, as the components do not fit cleanly in the current prototype, and reprint it. Finalize and print the camera mount prototype.
- **Carson:** Implement device pairing functionality for Arduino and decide what permissions the device accounts should be granted (Only Post Sensor Data and Images?). Set up the fish tank and buy fish if we have everything ready.
- **Max:** Go grab stuff from ETG to set up the tank and test the sensors in it, specifically the pH and DO sensors, because the DO sensor has been skewing the pH sensor readings when they're close together. Help Marina make changes to the Arduino and breadboard housing so everything fits better. Move some of the sensor code changes into the full Arduino code.
- **Danny:** Continue to work on the feed holder and then the servo mount in Fusion 360
- **Ryan:** Finish controllers documentation and move on to other classes.
- **Griffin:** Finish frontend software diagram, publish accounts page with log out feature, and guest account.

Summary of Weekly Advisor Meeting

- The team met last week to discuss our new plan for the semester. We were advised to create a new Gantt chart to detail each team member's workload. Additionally, we switched to Trello, a new issue tracker that will help keep our team more aligned and on the same page. Additionally, the team was instructed to schedule a meeting with an instructor to review progress to date.