EE/CprE/SE 491 WEEKLY REPORT 1

Report Details:

Timeframe: Beginning of Semester - 9/23/2025
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 Developer
Marina Mannan — Embedded Systems Engineer
Carson Irving —Backend/Frontend/AI
Max Purvis — Hardware

Weekly Summary

This week, the group's main focus was meeting with our client/advisor, planning, and gathering materials. On Thursday, we met with our client/advisor and discussed the overall project, as well as what we should get started on this week. We then moved on to planning, where we decided to start by collecting the basic equipment that is needed in order to keep a fish alive in the tank. We then submitted a request to purchase a fish tank.

Past Week Accomplishments

- **Aden:** Did research on what equipment is necessary for an aquarium. Started shopping around and comparing prices and features of aquarium equipment.
- **Marina:** Researched smart aquarium designs, existing implementations, required equipment, and potential microcontrollers.
- **Carson:** Ordered a 20-gallon fish tank through ETG, and started looking at ETG's recommended vendors for some of the hardware we will need. Also started thinking about camera placement in the aquarium and whether the decorations for the fish will impact the AI vision model.
- **Max:** Researched what equipment is needed for the fish tank, looked around online for possible 20-gallon tanks.
- **Danny:** Looked at the different sensors we would need in order to maintain a healthy environment.
- **Ryan:** Researched potential sensors and microcontrollers that meet the requirements for our project.
- **Griffin:** Project learning and research
    - Explored technologies that can be used in the project, including preconstructed sensor packages.
    - Researched potential software solutions for frontend and backend design problems.

Pending Issues

- N/A

Individual Contributions

NAME	Individual Contributions *(Quick list of contributions. This should be short.)*	Hours this week	HOURS cumulative
Aden	- Researched equipment - Started shopping for equipment	1	1
Marina	- Studied the key elements of a smart aquatic system - Started considering specific devices to purchase and how to implement them	2	2
Carson	- Ordered a fish tank - Considered complications of the AI vision model and potential obstacles - Sketched placeholder camera locations for the fish tank to consider model vision	3	3
Max	- Researched equipment - Started shopping for equipment	2.5	2.5
Danny	- Researched potential sensors that meet project specifications - Finding compatible microcontrollers - Start thinking about the PCB design	3	3
Ryan	- Began research for possible sensors and microcontrollers	1	1
Griffin	- Explored software platform options (frontend and backend) and framework options - Explored possible hardware options for sensors	2	2

Comments and Extended Discussion

- N/A

Plans for Upcoming Week

- **Aden**: Research cameras and AI software. Fill out forms for purchase. Set up the GitLab repository structure.
- **Marina**: Evaluate and select a microcontroller for purchase. Look into the software/programming libraries that will be needed to program the microcontroller.
- **Carson**: Look into how powerful a server we will need, and a potential free Oracle server to get something going with the software. Decide which language/framework we are going to use for the backend, and discuss what team members are familiar with.
- **Max**: Research more equipment and start figuring out what sensors we need to get and how to set them up.
- **Danny:** Finish up researching what MC and sensors we need with Max. Put in a buy order for all the components we decide on.
- **Ryan:** Help Aden set up the GitLab repository. Work with Max and Danny on finding a suitable microcontroller and compatible sensors for the tank.
- **Griffin:** Begin planning and pre-design of system architecture. Decide upon frontend/backend platforms/services needed for the project.

Summary of Weekly Advisor Meeting

The team asked lots of important questions to help get the ball rolling on the project and clarify several questions we had spoken about prior to the meeting. Maruf answered all of our questions well, and we created a Discord server with him and all team members to streamline communication.