

Web Application for Aqualab Sensor Monitoring and Analysis

Gregory Thompson - gthompson2022@my.fit.edu

Haley Hamilton - hamiltonh2021@my.fit.edu

Ruth Garcia - ruth2021@my.fit.edu

Faculty advisor from CSE: Dr. Slhoub - kshoub@fit.edu

Client: Dr. Turingan - Ocean Engineering and Marine Sciences

Progress of current Milestone

Task	Completion	Greg	Haley	Ruth	To do
<u>Implement, test, and demo</u> <u>Communicating with Sensors</u>	70%	10%	80%	10%	Test with real sensors once arrived, implement check data range and send alerts functionality.
<u>Implement, test, and demo</u> <u>User Interface</u>	80%	0%	5%	95%	Complete user authentication functionality.
<u>Implement, test, and demo</u> <u>Recording Data</u>	100%	60%	40%	0%	None.
<u>Implement, test, and demo</u> <u>Uploading to Cloud</u>	30%	30%	70%	0%	Need to add further functionality, test, and demo.
<u>Investigate Technical Tools</u> <u>and "hello world" demos</u> (from M1)	100%	10%	90%	0%	None.

Discussion of each accomplished task (and obstacles) for the current Milestone:

- Implement, test, and demo *Communicating with Sensors*:
 - Our main program framework has been developed including classes for the sensors, a class to run our Flask server, and our main program control. In the main program, the system reads in the sensor configuration from the database and creates separate threads to monitor and read data from each sensor. The lab team has finalized their sensor choices and are in the process of ordering them. We

have the techniques needed to read data from the sensors, and the sensor classes currently return placeholder data for testing purposes.

- Implement, test, and demo *User Interface*
 - Utilizing our test demo from the last milestone, we have structured the framework of our frontend pages and added all necessary content with reference to the GUI mockups in the design plan. Each page has been styled with CSS for a user-friendly look and feel. This will be demoed for the client at the beginning of the next milestone to receive feedback and we will make changes.
- Implement, test, and demo *Recording Data*
 - All of the data we are working with is stored in a MongoDB database. The Flask app is set up to handle GET, POST, REMOVE, and UPDATE requests so the users can submit new data, update, or remove data in the database. This allows users to view sensor data, specify a desired data range, and update user or system settings and these changes are made to the database. Also, after the data is read from the sensors in the main program, the data is stored in the database.
- Investigate Technical Tools and "hello world" demos (from M1)
 - Technical tools were decided and a demo was created to upload the sensor data from the database to the cloud. This includes using Google-cloud-storage in Python to upload the data to Google Cloud.
- Implement, test, and demo *Uploading to Cloud*
 - Integration of the tools and demo has begun to upload the sensor data to the cloud, however we need to discuss with the client about how they expect the data, if they are comfortable using Google Cloud or would prefer another service, etc. before we continue implementing this functionality.

Discussion of contribution of each team member to the current Milestone:

- Gregory Thompson:
 - Created the multithreading framework to connect sensors, the database, and the user application. All data shared between threads is protected by a semaphore (Python Lock) to prevent corruption.
- Haley Hamilton:
 - Created and structured the Flask application framework. The app can connect multiple users and allow GET, POST, REMOVE, and UPDATE requests. Integrated the Application to the sensor reading framework. Created the sensor classes and functions allowing the main program to connect and disconnect to a serial port as well as read the sensor data. Tested the overall program at the end of the milestone to ensure desired functionality.
- Ruth Garcia:
 - Created and styled the frontend user interface using React, JS, HTML, and CSS. Referenced the GUI mockups in the design document and ensured each page and display was intuitive and user-friendly.

Task matrix for Milestone 2

Task	Greg	Haley	Ruth
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Implement, test, and demo <i>Displaying the data</i>	5%	5%	90%
Implement, test, and demo <i>Data Analysis Tools</i>	90%	5%	5%
Implement, test, and demo <i>Accessing Recorded Data</i>	5%	90%	5%

Discussion of each planned task for the next Milestone

- Implement, test, and demo *Displaying the data*
 - This task includes ensuring the frontend and backend are able to communicate to each other, specifically that the frontend is able to read data from the backend and display it on the user interface correctly. This includes the Login page and user authentication, displaying the graphs and settings on the Home page, displaying the settings on the User Settings and Settings page, and the functionality of the Data Analysis tool.
- Implement, test, and demo *Data Analysis Tools*
 - This task includes developing the Data Analysis tool functionality. The client wants the correlation between specific variables calculated automatically. The analysis tools will also be able to generate various graphs, as requested by the client. Ensuring the front end can communicate user-imputed filters to the backend and receive the resulting data to display for the user is crucial.
- Implement, test, and demo *Accessing Recording Data*
 - This task includes ensuring different parts of the system have access to the data stored in the database for their given task. This includes the create, read, update, and delete functions between the backend and frontend, the main program checking and storing the data once it is read from the sensor, and the user's ability to delete or move data to a secondary storage.

Date(s) of meeting(s) with Client during the current milestone: Monday, October 21st

Client feedback on the current milestone:

- We updated the client on our development progress and how we are simulating the sensors by using placeholder data
- We communicated further about the sensors, specifically about the state of ordering them and when they would be delivered. We also discussed the process of installing sensors (this is the client's job responsibility).
- The client's feedback was positive; there was no further feedback. The client verified that they would get the sensors to us so we could start testing with them.

Date(s) of meeting(s) with Faculty Advisor during the current milestone: 10/25/2024 (Zoom meeting) and communicated via email.

Faculty Advisor feedback on each task for the current Milestone:

- Implement, test, and demo Communicating with Sensors **Satisfied**
- Implement, test, and demo User Interface **Satisfied**
- Implement, test, and demo Recording Data **Satisfied**
- Implement, test, and demo Uploading to Cloud **Satisfied**

Faculty Advisor Signature: Dr Khaled Silhoub Date: 10/26/2024

Evaluation by Faculty Advisor

Faculty Advisor: detach and return this page to Dr. Chan (HC 209) or email the scores to pkc@cs.fit.edu

Score (0-10) for each member: circle a score (or circle two adjacent scores for .25 or write down a real number between 0 and 10)

Gregory Thompson	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Haley Hamilton	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Ruth Garcia	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10

Faculty Advisor Signature: _____ Date: _____