

EE/CprE/SE 491 WEEKLY REPORT 06

03/07/22 – 03/11/22

Group number: sdddec22-14

Project title: Machine Learning for Human Biometrics

Client &/Advisor: JR Spidell & Akhilesh Tyagi

Team Members/Role:

Ritvik Maripally: Security Manager

Ron Mei Hang Teoh: Database Manager

Yee Shen Teoh: Hardware Manager

Zi-Jan Wong: Machine Learning Manager

Nathanael Morris: Machine Learning Manager

○ **Weekly Summary**

This week, Ron presented about the communication between database and the machine learning algorithm, while Ritvik presented about the security and legal issues with the data we are using. We have identified what steps should be taken for several different cases regarding the communication between database and machine learning algorithm, and the security issues.

○ **Past week accomplishments**

Yee Shen Teoh:

- Reading the datasheet of the provided camera to understand the features of the camera and how to connect it to the Ultra96 board. Our project is heavily reliant of the camera, so understanding the connection between the camera and the board will be highly important.
- Tried connecting the board with a monitor to check if the display are working correctly. The display is also very important for our project since the display are where the result is going to be shown.

Ron Mei Hang Teoh:

- Created bounce diagrams to identify the function calls going back and forth between the database and the rest of the system.
- Identified several important SQL commands to be used in the database (eg. CREATE DATABASE, INSERT, DELETE, SELECT, etc.).

Zi-Jan Wong:

- Did some examples on Python codes about files such as opening files, write to files and so on because the dataset has files and to be familiar with open and reading it.
- Installed multiple modules to run the required imported modules of the dataset so that there are no errors.

Ritvik Maripally:

- Ultra96 isolation methods and presentation.
- Planning of method application for the isolation/safety net of ultra96.
- Organized the cybersecurity laws on which grounds our project would be held, Ex. in illinois certain biometric laws apply while in iowa it doesn't.

Nathanael Morris:

- Learned about Python by reviewing code files, specifically a dataset that was used for analyzing eye movement and producing the pupil's coordinates on an x-y plane.
- Implemented a ReModNav algorithm on the dataset to find classify eye movements based on the x-y movements of the pupil.

○ **Pending issues**

Yee Shen Teoh: N/A

Ron Mei Hang Teoh: N/A

Zi-Jan Wong: N/A

Ritvik Maripally: N/A

Nathanael Morris: N/A

○ **Individual contributions**

| <u>NAME</u> | <u>Individual Contributions</u> | <u>Hours this week</u> | <u>HOURS cumulative</u> |
|--------------------|---|-------------------------------|--------------------------------|
| Ritvik Maripally | <ul style="list-style-type: none">- Initial Planning on isolation methods- Examples of cybersecurity methods we could apply to project- Checked on how we are able to store data safely | 6 | 36 |
| Ron Mei Hang | <ul style="list-style-type: none">- Created bounce diagrams for several | 6 | 36 |

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|------------------|---|---|----|
| Teoh | <ul style="list-style-type: none"> use cases - identified several important SQL commands | | |
| Yee Shen Teoh | <ul style="list-style-type: none"> - Check the connection between the camera and the board - Check the connection between the board and a monitor for display | 6 | 36 |
| Zi-Jan Wong | <ul style="list-style-type: none"> - Did some examples on Python codes and installing modules to run the dataset through without errors | 6 | 36 |
| Nathanael Morris | <ul style="list-style-type: none"> - Started understanding Python code by reviewing a dataset and discovering how it works | 6 | 36 |

○ **Comments and extended discussion**

N/A

○ **Plans for the upcoming week**

Yee Shen Teoh: Try connecting the camera to a display, and work on small project found in hackster.io. Those are going to help with our understanding of the board for the implementation of our project.

Ron Mei Hang Teoh: Add in several details for each database use case (size of data, latency, frequency, backup plan, etc).

Zi-Jan Wong: Go through the machine learning dataset to try to understand, try to inject different datasets into the code.

Ritvik Maripally: Talk to Ron about how to implement databases and store data safely against intruders.

Nathanael Morris: This week I will be meeting with our advisor to get a lesson about machine learning and how to create algorithms. I will then use what I learn from this meeting to practice implementing ML algorithms.

○ **Summary of weekly advisor meeting**

No meeting with the advisor, but we updated him about some of our project requirements via email.

