EE/CprE/SE 491 WEEKLY REPORT 04

2/21/22 - 2/27/22

Group number: 14

Project title: Machine Learning for Human Biometrics

Client &/Advisor: JR Spidell & Professor Akhilesh

Team Members/Role:

Ritvik Maripally: Security Manager
Ron Mei Hang Teoh: Database Manager
Yee Shen Teoh: Hardware Manager
Zi-Jan Wong: Machine Learning Manager
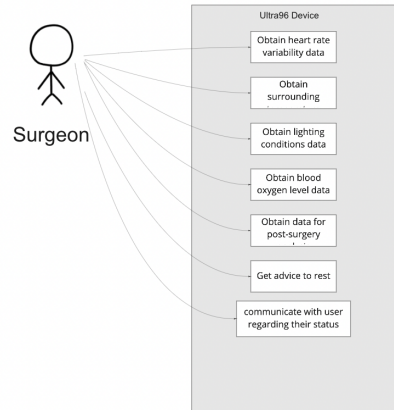*Nathanael Morris: Machine Learning Manager*

- **Weekly Summary**

   Our group talked more in depth about who our users are going to be. After some discussion, we decided that it is best to focus on surgeons for our project. We also decided on using Ultra96, and should be getting the board next week on Tuesday. Nathan also give the team a presentation about REMoDNaV.
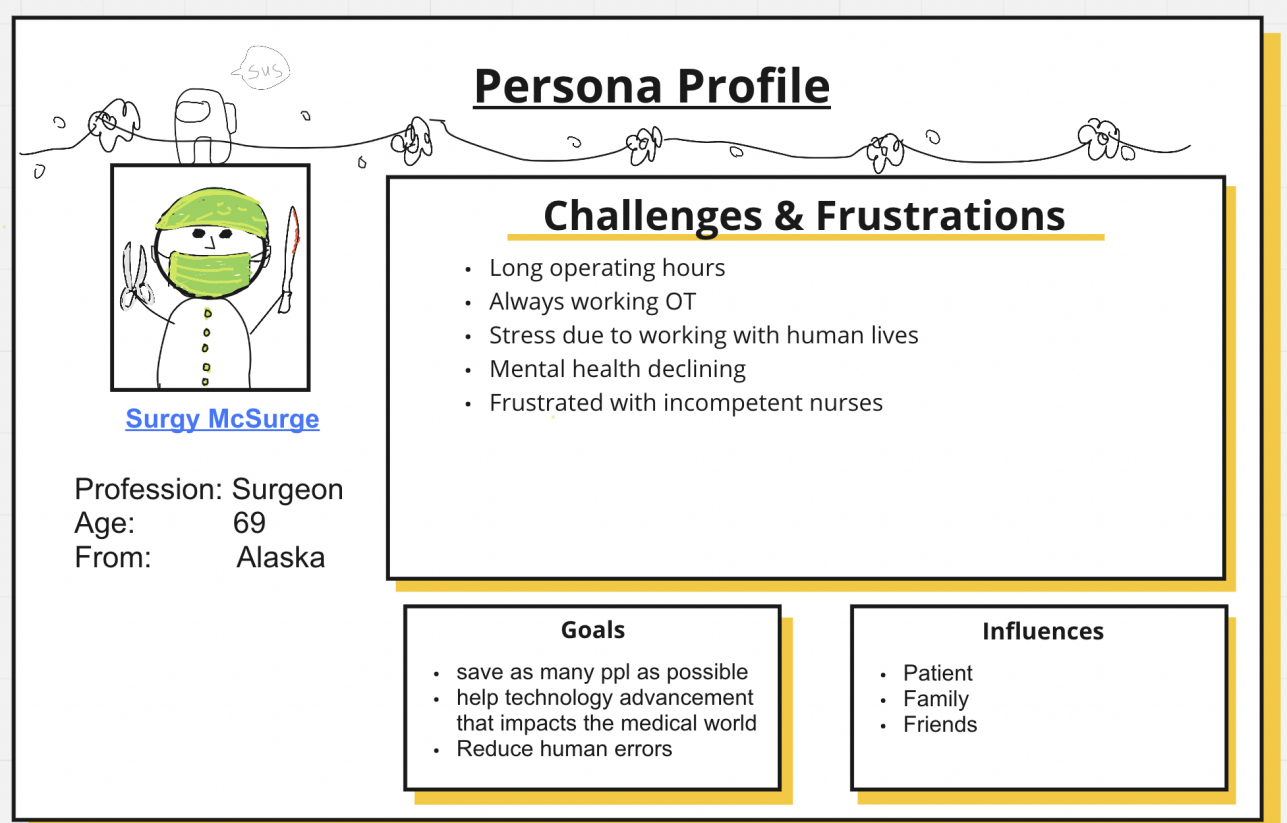
- **Past week accomplishments**

   - Ritvik Maripally: Made a presentation about security and why it is important.
   - Ron Mei Hang Teoh: Narrowed down the choice of database to InfluxDB, and learned more about InfluxDB syntax, and its difference and similarities compared to other databases.
   - Yee Shen Teoh: Continue looking for more information regarding Ultra96, especially small projects that we can work on to increase our familiarity with the board. Waiting for the Ultra96 board to arrive so that we can start working on those small projects, and build towards completing our project.
   - Zi-Jan Wong: Studied and went through the machine learning codes.
   - Nathanael Morris: Continued learning about machine learning and training neural networks. Executed ipynb file using Jupyter notebooks.
   - Below is the Use-Case Diagram that we worked on in class.

Use Case Diagram

Ultra96 Device

Surgeon

- Obtain heart rate variability data
- Obtain surrounding
- Obtain lighting conditions data
- Obtain blood oxygen level data
- Obtain data for post-surgery
- Get advice to rest
- communicate with user regarding their status

- Below is the Persona Profile that we worked on in class.

Persona Profile

Surgy McSurge

Profession: Surgeon
Age: 69
From: Alaska

Challenges & Frustrations

- Long operating hours
- Always working OT
- Stress due to working with human lives
- Mental health declining
- Frustrated with incompetent nurses

Goals

- save as many ppl as possible
- help technology advancement that impacts the medical world
- Reduce human errors

Influences

- Patient
- Family
- Friends

- o **Pending issues**
  - Ritvik Maripally: N/A
  - Ron Mei Hang Teoh: N/A
  - Yee Shen Teoh: N/A

- Zi-Jan Wong: N/A
- Nathanael Morris: N/A

o **Individual contributions**

NAME	Individual Contributions	Hours this week	HOURS cumulative
Ritvik Maripally	- Learned more about isolation methods on Ultra96 - Made presentation about security measures in the class	6	24
Ron Mei Hang Teoh	- Learn more about InfluxDB, specifically its subscription plans, syntax, integration etc. - Identified different use cases for the database	6	24
Yee Shen Teoh	- Continue studying about Ultra96 and look for smaller projects implemented using the board. - Look at videos about Ultra96.	6	24
Zi-Jan Wong	- Continued looking at Python videos, elevator pitch slides	6	24
Nathanael Morris	- Continued looking at ML learning algorithms and learning how to train neural networks	6	24

o **Comments and extended discussion**
  N/A

o **Plans for the upcoming week**
- Ritvik Maripally: More isolation methodology learning and looking at zynq
- Ron Mei Hang Teoh: Lookup on how to integrate InfluxDB with the rest of the system, and the different types of data that we need to collect (eye movement, heart rate variability, galvanic skin response)
- Yee Shen Teoh: If the board arrived next week, we will start working on smaller projects to get familiar with the board. Otherwise, we will look for videos or information of people working with the board to get a third person perspective of how the board works.
- Zi-Jan Wong: Meeting leader of the team, set up WebEx room for meeting, try to execute the machine learning code using the trained model with a smaller dataset.
- Nathanael Morris: This week I will use a dataset sent by our client to practice applying the

REMoDNaV algorithm to dynamic data to get eye-movement classifications.

- o **<u>Summary of weekly advisor meeting</u>**
  We did not have a meeting with our advisor this week.