1/26/24 - 2/10/24
Group Number: 15
Project Title: PTSD Detection Device
Client &/Advisor: BAE Systems / Rachel Shannon
Team Members: Casey Halbmaier, Caden Backen, Coby Konkel, Ben Gardner, Andres Cebellos, Nihaal Zaheer

Weekly Summary:

Since the last bi-weekly report, the team has been hard at work trying to put together a prototype wearable device that can be sent out for data collection. Our main goal is to send out these prototypes so that we can collect biological data for our PTSD detection algorithm. With a lack of data on PTSD attacks publically available, the team needs to collect sample data to build off of. We've run into some roadblocks along the way, mainly hardware-oriented, that have kept us from achieving this goal. However, the team has made strides in beginning the software side of this project by creating files for the MAX Sensor and SD Card reader.

Past Week Accomplishments:
- **Hardware:**
  - The basic schematic for the prototype wearable device has been completed.
- **Software:**
  - Project creation has been completed on GitLab.
  - Team GitLab has been reformatted to match our current plans and goals in terms of Software.
  - Testing with SD Card reading and sensor input has begun on separate GitLab branches.
- **Overall:**
  - Survey:
    - We need to be careful when sending out surveys which ask for personal, biological information.
    - The IRB is also crucial for this survey. Everything needs to go through them.
    - Rachel Shannon has already reviewed the survey, just needs team approval.
  - GitLab:
    - Last semester's GitLab issues have been closed, and new ones have been created to match the team's current progress and goals.

Pending Issues:

- **Hardware:**
  - The SD Card PU Schematic needs to be completed.
  - The MAX Sensor Bypass Cap needs to be established.
  - ESP Wiring needs to be figured out.
  - The Power Schematic needs to be completed.
  - Need to figure out how we're going to solder parts together. Will we order out?
- **Software:**
  - I2C sensor reading needs to be figured out. Testing with sensor libraries will continue.
  - The SPI: SD Card needs to be figured out. Testing with the SD Card libraries will continue. Ultimately we need to determine functionality and storage.
  - Data Structures need to be determined for biological information. How are we going to store biological data that is collected?
- **Overall:**
  - Survey:
    - Need to get in touch with the IRB to get permission to send out our survey.
    - A list of survey-takers needs to be created so we know who to send the survey to.

Individual Contributions:

Name	Individual Contributions	Hours (this week)	Hours (cumulative)
Casey Halbmaier	Created a survey to 'screen' veterans, helped to set up Gitlab, began working with SD Card reader code on GitLab.	5	12
Caden Backen	Created header code file and researched implementation methods for the code relating to our MAX sensor. Read through the updated data sheet and copied important configuration information into the header file. Reviewed questionnaire questions.	5	~6
Coby Konkol	Setup KiCAD, schematic for SD card, MCU, SPO2/PPG sensor, setup Gitlab, setup readmes, setup	12	26

	libraries for project, setup code projects, setup Kicad project, Imported CAD models for parts, interviewed PCB experts		
Ben Gardner	Sick this week. Set up KiCad last week	0	~7
Andres Ceballos	Setup KiCAD, working on interfacing SD card with breakout board, pico to max pins, and continuing research on pull up resistors and capacitors	6	12
Nihaal Zaheer	Researcher ESP32 SPI and I2C usage, Pinots and GPIO ports. Researched MAX datasheet for SPo2 and PPG and ECG usage with register initializations.	0	4

Plans for Upcoming Week:
- **Hardware:**
    - Complete remaining schematics for necessary processes.
    - Determine what the best course of action is for soldering parts together.
    - Put in an order for any needed parts using the updated BOM list.
- **Software:**
    - Continue work on MAX Sensor, SD Card and Main functions.
- **Overall:**
    - Collect a list of potential participants for our PTSD survey.
    - Send out the PTSD survey to potential participants.

Summary of Weekly Advisor Meeting:

The team's meeting with Rachel Shannon helped point us in the right direction with collecting data on PTSD attacks. Rachel, a veteran, is a patient with the Des Moines Vet Center. As such, she reached out to inquire about participants in our prototyping. Within minutes of sending the email, we received a response. We are being allocated 5-10 veterans to help with this project, under the assumption they fit our needed criteria. In order to filter down to who we need, Rachel has suggested sending out a survey with questions that are meant to determine who would be best for prototyping our device for data collection. The survey has been created and approved by Rachel, but the team still needs approval from the IRB.