EE/CprE/SE 491 WEEKLY REPORT 9

Start Date – End Date: 11/8/2024 - 11/14/2024

Group number: 13

Project title: PTSD Detection Device

Client &/Advisor:

Advisor: Mohammed Selim

Mentors: Bae Systems - Alice Crutcher, Michael Goderre, Jennifer Plakyda, Ryan Littler

Client: America's VetDogs - Cheyenne Whitetree

Team Members/Role:

Justin Scherrman - Design Engineer - Communications and Sensors

Neil Prange - Software Engineer

Aidan Klimczak - Design Engineer - Microcontroller

Justin Jaeckel - Software Engineer - Embedded systems

Ty Decker - Security - Stenographer

Katerina Zubic - Team organizer and sensor engineer

- **Weekly Summary**
  - Working on data acquisition via I2C
  - Increasing bluetooth communication functionality
  - Working on vibration device configuration

- **Past week accomplishments**

  - Bluetooth communication functioning properly (one sided)

- Vibration devices received
- Settled on Bluetooth protocols
- Receiving data from the PPG sensor to the microcontroller

Neil Prange - Research/Testing

- Almost finished implementing MSPTD algorithm translation to C
- Began working on I2C communication between ESP32 and PPG sensor

Aidan Klimczak - Research/Design

- Worked on the project schematic in bluebeam for the overall design.
- Worked on small devices like the LEDs and Vibration devices.

Justin Scherrman - Research/Design

- Communication between two esp32 microcontrollers
    - Arduino IDE BT communication to phone.
- Created team website

Justin Jaeckel - Research / Development

- Continued development into heartbeat sensor interfacing
- Started researching how to program accelerometer

Ty Decker - Research / Security

- Researched ESP32 hardware security accelerators.
- Researched Bluetooth Profiles, specifically Heart Rate Monitor (HRM)

Katerina Zubic - Research & Testing

- Bluetooth communication between microcontrollers.
    - Able to get characters to send over, but the information is convoluted. Need a way to clean up the data that's being transmitted/received.
- Verified motor functionality

- **Pending issues**

- Pending America's VetDogs reply with data about PTSD attacks.
- America's VetDogs is tracking down a prototype vest for us to use.
- Getting Bluetooth to enable without the computer initializing the code to run.

- **Individual contributions**

NAME	Individual Contributions	Hours this week	HOURS cumulative
Neil Prange	Nearly completed beat detection algorithm	4	46

	translation, began looking into data acquisition with PPG sensor		
Justin Scherrman	Created Team website, Arduino IDE Bluetooth communication	5	45
Justin Jaeckel	Continued working on i2c protocol and started research into accelerometers	4	44
Aidan Klimczak	Worked on the project schematic in bluebeam for the overall design. Worked on small devices like the LEDs and Vibration devices.	4	42
Katerina Zubic	Bluetooth microcontroller to microcontroller communication. Verified motor functionality	4	41
Ty Decker	Researched security hardware accelerators. Looked into accelerator implementation on ESP32.	4	42

- **Plans for the upcoming week**

  - Develop Kicad design
  - Develop Power Schematic from real-time current measurements
  - Continue to develop bluetooth connections
  - Continue to develop PPG sensor data.

- **Summary of biweekly advisor meeting**

N/A - No meeting this week