Design Review 3 Agenda

EEG Alarm Group
Dr. Schafer
Stinson-Remick 205
12:00 PM March 31, 2023

Leader: Jackson Bautch
Scribe: Alex Beck

Agenda
1. Design Review 3
   a. Demonstration of end to end functioning, integration of all subsystems
      i. EEG subsystem
      ii. Pulse Oximetry Subsystem
      iii. IoT Subsystem
   b. System Requirements
2. Going Forward
3. Comments and Questions

Design Review 3 Notes

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a. I2C address shouldn't change when switching between ESPs, but not finding the device is an address issue
   i. Look at working code in Logic Analyzer, save trace. Compare that to Logic Analyzer of non-working
   ii. Is the ESP worth the default I2C?
   iii. If we are assigning pins to the wire, you can call wire command yourself with SDA and SCL
      1. Header file will call wire function itself, but we can call it agin to assign our own pins
   iv. MAX30101 senses pulse ox - mounted on wrist or finger. Could you take these measurements from the blood on your chest, put pulse ox in housing?
b. Board ordered with Wizard Chess and LIDAR
   i. Added enable and GPIO
   ii. EAGLE
      1. File can be sorted by parts, attributes
      2. ULP that can go through board file to create BOM
      3. Resistors have to be standard I2C pull up sizes. Some of these we won't have to order (stocked in 205)
         a. All resistors are 0603
c. Solder/aluminum foil to attach wire
d. Immediately recording 5 seconds of data from ADC. Sends to Spiffs to be displayed (graphed) on website
   i. Eventually task will start off suspended and be activated by user pressing the button
e. Stylistic changes needed, but main goal was to get javascript to accept an array, which it is doing now
   i. Data is unfiltered, add averaging function
   ii. Website can also display an integer, which will be average heart rate from that monitor
f. Board will sit on chest with a velcro band and 3D printed housing. Casing will have battery, chip
   i. 3 wires -> 1 lead, 3 stickers
      1. Need more leads/pads to test device on faculty
   ii. Wire attaching pulse ox should be long enough to be comfortable but not long enough to choke you- detachable to choose if you're using both?

g. Technology to run constantly in the background and detect anomalies is too advanced. Should be able to detect AFIB
    i. If same user has been using the device for a while it will have an understanding of how their heartbeat runs and detect a difference there
    ii. Recommendations outside normal ranges of heart rate/oxygen saturation
h. How to get device on the network? Served locally, don't need a server for it to go to (built into ESP32). Connect phone/browser to IP
    i. Need instructions on how to do
    ii. App that automatically connects to the network and brings up the browser. This avoids switching wifi
i. Archive website- upload proposal, high level design, final documentation, zip files of code, any corrections made to board after ordered
    i. Another design team should be able to pick up where we left off
    ii. Poster- ESC Help prints posters (in Fitz). Use the mounting from someone else's board to save $
j. Demo Day is a poster session/conference. Final presentations of projects will be before this (end April). SDNet will come downstairs to 109 atrium. Faculty will evaluate
k. Change to ECG for everything (except order forms)