Electroencephalogram (EEG)

MINT - Electrical Team

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1   Introduction

This project is a sub-system of one larger project called the MENTHA project. This project requires students to collaborate and design a bipedal moving robot controlled through an electroencephalogram. The sub-systems of this project include:

- Electroencephalogram

- Signal Processing

- Power Control PCB

- Bipedal Robot Design

- Servo/Joint Control

- Battery Charging System

This documentation file will focus only on the Electroencephalogram. It will cover the planning stage, the process, and the iterations taken throughout the project.

2 Requirements

2.1 MENTHA

The MENTHA team requires the following for this sub-system:
- Filter and amplify 8 bio-signals with minimum noise or electromagnetic interference.
- Digitize 8 bio-signals recieved from the brain.
- Perform low level processing to the signals and transmit to a laptop.

2.2 MindTap

The MindTap team requires the following for this sub-system:
- Smaller dimensions for the PCB than the OpenBCI Cyton Board.
- Similar to the Cyton Board, but without the SD Card or Wifi.
- Able to transmit 8 digitized signals through BLE to any device for further processing.

3 Strategy

Separate the PCB into two separate boards, where one will test the amplification and filtering of the analog signal, and the other will test the digitization and minor processing.

3.1 Digitizer

The digitizer PCB will use an analog to digital converter connected to a microcontroller which has a BLE module. This board will need a usb-c connection for flashing the microcontroller and interfacing with the signal data.

3.2 Components

- ADS1299
- ESP32-WROOM-1