Senior Design Team 301: Safe-X

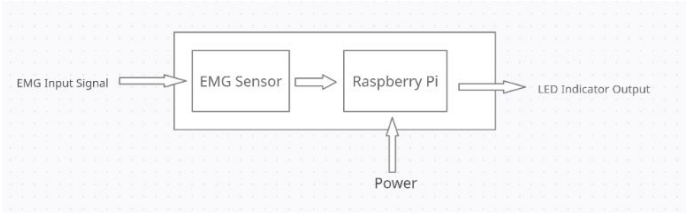
Objectives

- Test Software and Setup recording procedure
- Fine tune and print Chassis
- Assemble and Deliver prototype
- Collect data
- Improve machine learning algorithm

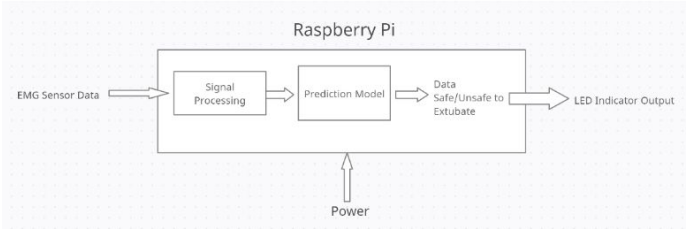
Block Diagram

Level 0:

Level 1:



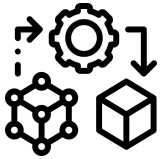
Level 2:



Our top level design has our 7-EMG lead signals and power coming into Safe-X to supply power to our Raspberry Pi and EMG sensor

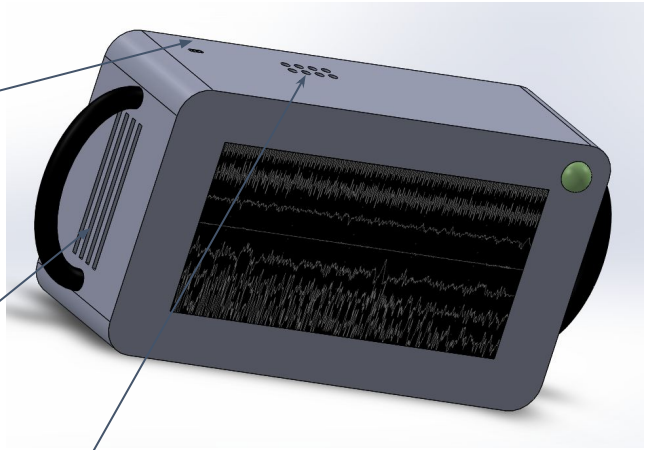
Inside of Safe-X there are two major components, the Raspberry Pi and the EMG sensor. The EMG sensor software will be run on the Raspberry Pi and the software will be display on a LCD screen to monitor EMG status

The Raspberry Pi will take the processed signal from the EMG software and will be run through our classification model to determine if it is safe or not to extubate a patient

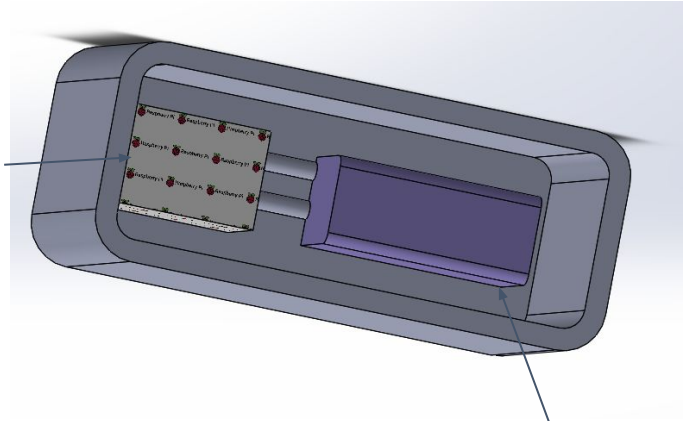
Device Model 

- We have received all necessary components and have begun the connection of the individual parts
- Design of the chassis is underway and will be 3D printed when done at the University Innovation Hub
- Once chassis is printed the parts will be secured in the chassis and the prototype will be completed

Device Model

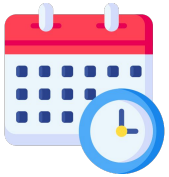


Top - Down View of Safe-X



Internal View of Safe-X

Time plan



Have prototype built

Finish printing chassis and assemble all internal parts inside the chassis. Make sure the device is capable of daily use.

Visit Mayo Clinic and Deliver Prototype

On our trip to Mayo Clinic's Campus, we will deliver our prototype and instruct on how to use on patients for data collection

Fine tune Classification Model

As more data comes in, our model will be able to be improved upon, until a satisfactory accuracy rate is met

2/17 — 2/20 — 2/23 — 3/1 — 3/30

Connect Device to cloud server for data collection

Set up EMG software to automatically record data and upload it to our shared cloud between Mayo Clinic

Develop Machine Learning Algorithm

From the new data we will be collecting, we can start to form the basis of normals for our classification model

Questions?