Project Title: Capacitive Textile Sensing (CTS)

An e-Textile for sensing the applied pressure on body to measure motor-neurological response in Glasgow Coma Scale (GCS)

Project Goal

The main goal is to built a textile based pressure sensor that helps the physicians to measure the Eye and Motor response over applied pressure of a traumatic patients according to Glasgow Coma Scale (GCS).

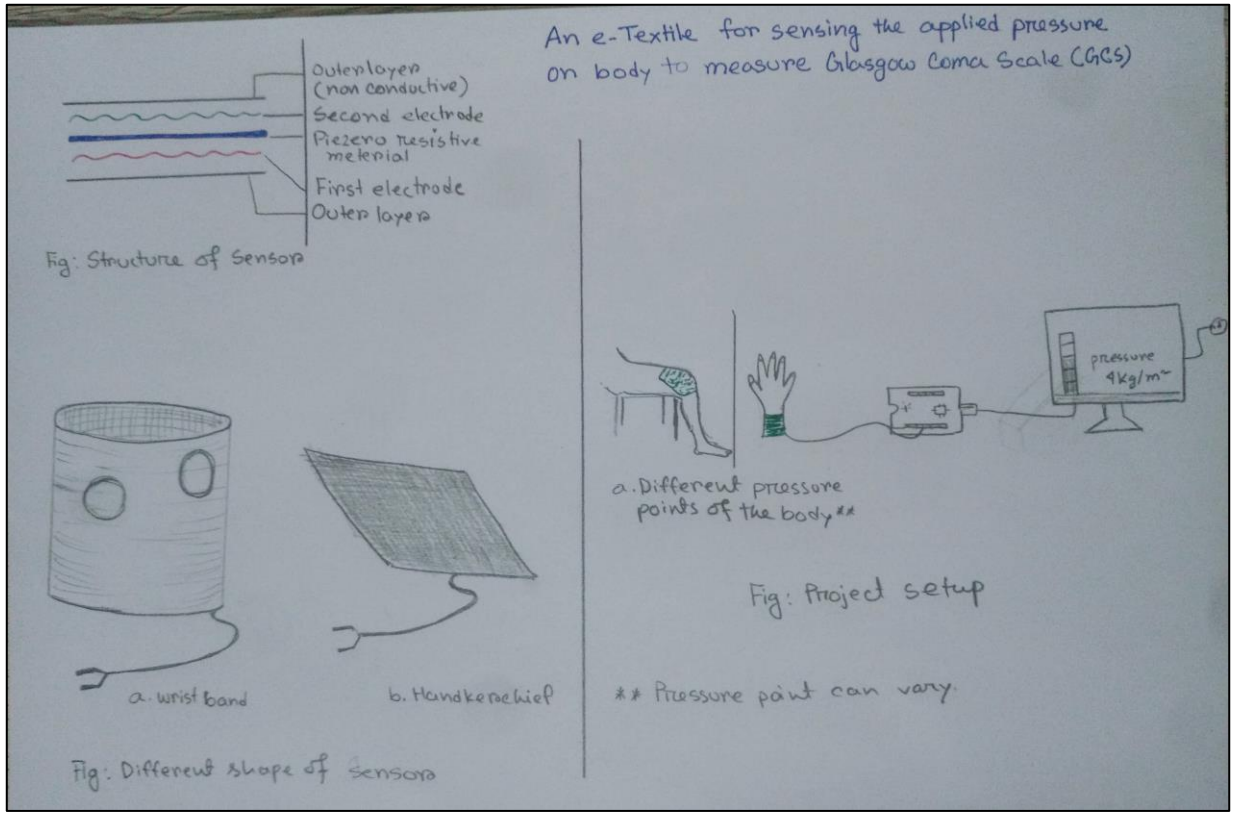

Figure: Overall project setup

How to accomplish it?

My prototype will sense the external pressure applied on it, measures and displays to the monitor. The mapped to the GCS based on physicians observation (optional)

Build a textile pressure sensor

- Non-conductive fabric for outer layer & structure
- Conductive Fabric- Anode and Cathode
- Piezo-resistive Fabric- Conductive and pressure sensitive

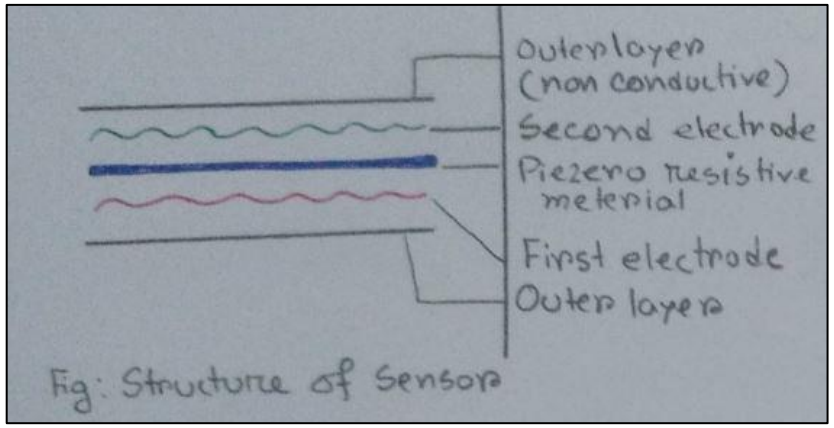

Figure: Making procedure of sensor

Mapping and Data visualization

- Map the applied pressure to the response threshold value of GCS
- Arduino Serial monitor and Plotter for display.
- Proposed: Python can be used to data visualization and interaction

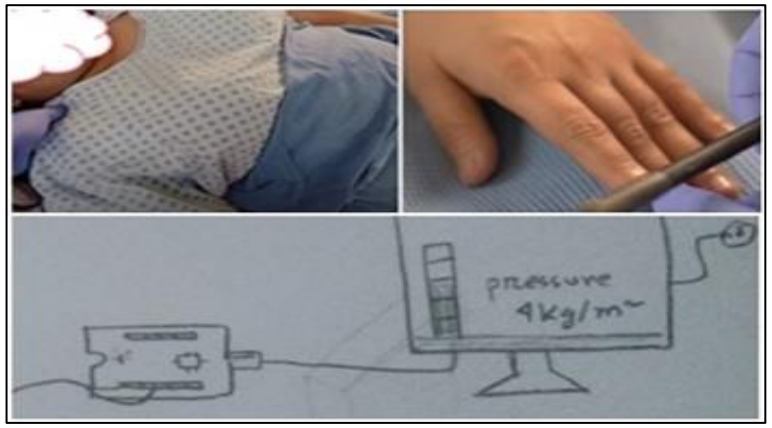

Figure: Mapping and data visualization

Challenges

Technical Implementations	Interaction design
• Time: making the textile sensor within short time. • Making textile sensor requires depth knowledge and expertise. • Choose the best technique for pressure measurement • Huge amount of user study and data needed for GCS mapping to the external stimuli • High precision and sensitivity: Available fabric lack of these quality.	• Given 15 x 15 frame size is literally small for this project • Lack of user study and observation for interactive layout design. • User feedback is required to choose the layout of the sensor that suits best to that environment

Current status

- ✓ Gather background study for sensor done
- ✓ Sensor design is done
- ✓ Workable prototype is done and linked to the Project WiKi
- ✓ Data visualization technique selection is done
- ❖ GCS mapping technique is still in process
- ❖ Relation between applied stimuli and GCS scale in progress

Prototype

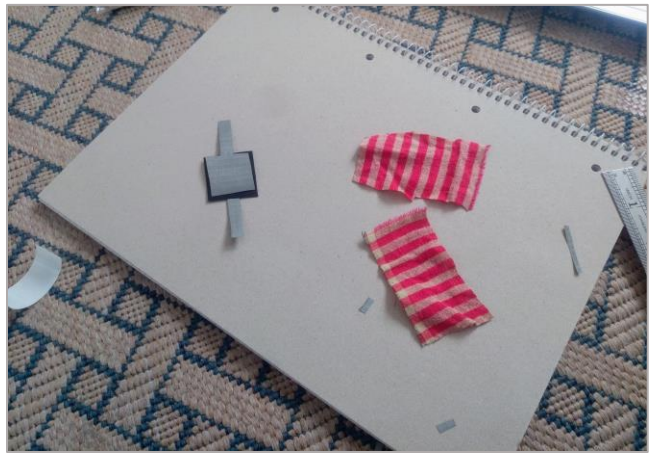

Figure (a)

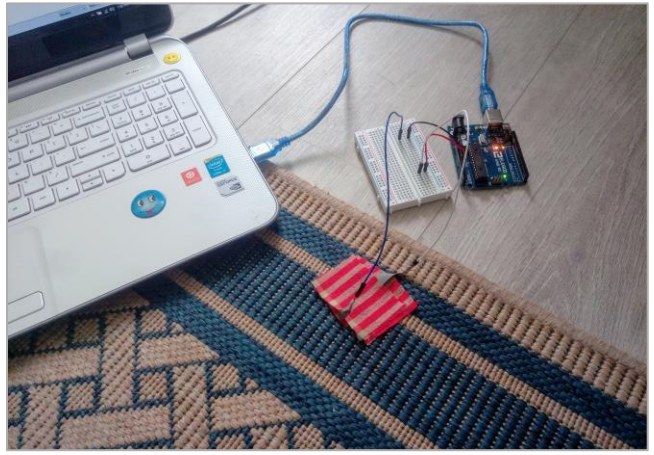

Figure (b)

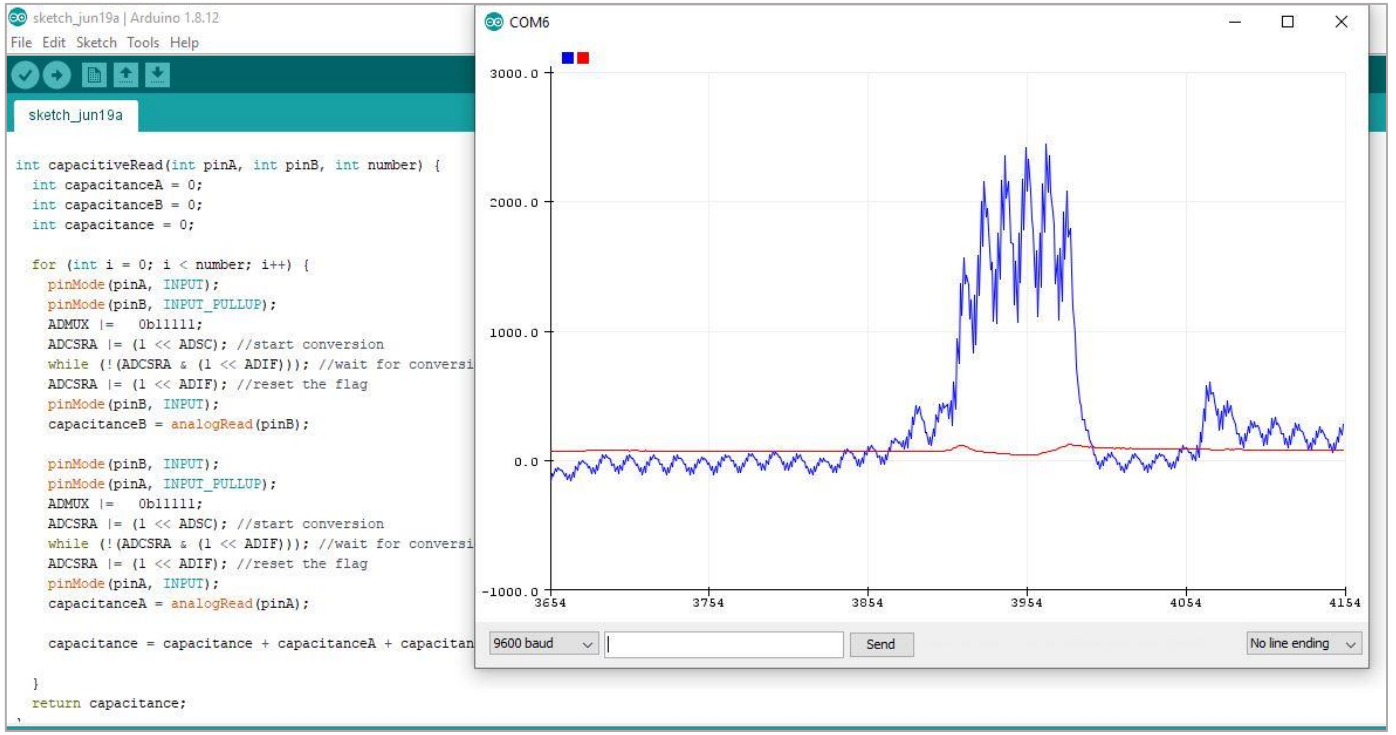

Figure (c)

Figure: (a) Making of the textile sensor, (b) connect the sensor to pc via Arduino, (c) output when pressure applied

Open questions to solve

- Finding the minimal threshold value for eye response
- Finding the minimal threshold value for motor response
- Finding the optimal mapping technique between applied stimuli and GCS
- Better technique for data representation and visualization
- Generalization for other GCS scale