

Project 4 Task List

Task 1: Data collecting

- 1) Obtain data from IMPACT Lab.
- 2) Understand data format
- 3) Understand **stimuli**
- 4) Segment data using stimuli

Task 2: Scientific Design

- 1) Find stimulus(incongruity). Use 3-4 different stimulus
- 2) Data collection. Collect significant data.
- 3) Training/ testing (**weka**). Separate the collect data into training and testing.
- 4) Machine learning. Use different machine learning algorithms to analysis the data.(SVM, Deep learning)
- 5) Accuracy analysis.

Task 3: Signal Processing

- 1) Find the stimulus (incongruity) Use 3-4 different stimulus.
- 2) Data collection
- 3) Extract brain data after 300 millisecond for 1 s. Design a Signal processing algorithm to detect N300 using a peak detection algorithm(**-ve responses**) after which has a **slow wavering sine wave**.
- 4) Implement in real time(Matlab). Read in data from a file and perform a continuous detection
- 5) Performance analysis(real time) i.e. Time taken to detect N300.

Task 4: Using **P300**&N300 To Predict User Input

- 1) Develop an UI to deliver the stimulus(TBD) and collect brain data. Synchronization is required to determine the **window** of P300/N300.
- 2) Collect user's brain signal and ask for their feedback. (Obtain user feedback via the GUI). a-x, b-x, c-v; a-v; a-x,b-x,t-v ----> CAT.
- 3) **Annotate the brain data**.
- 4) Look for N300 and P300 response.
- 5) Validate the claim by comparing the user feedback and the brain data. (i.e. 88% accuracy.)