# Project Requirements

**Aims and Objectives**

* **Aim – Produce a functional classification system for events found within scalp EEG data, this will occur via the implementation of feature extraction techniques followed by machine learning and deep learning algorithms to infer meaning from the indicated features.**
* **Essential objectives (these are the objectives discussed previously in the poster, but further expanded upon).**
  + **Obtain Data**
    - Two main datasets are considered here:
    - the first of which is a publicly available dataset that can be either human or animal based.
    - The second of which is a potentially supplied dataset that will include animal-based EEG information
    - The project title will depend on the dataset, although this can be sorted at a later date.
  + **Research and select the relevant channels for the indicated dataset EEG signals and event variations.**
    - This can reduce the dimensionality of the data.
    - This may prove difficult or rather specific to either the problem itself (the areas of the brain affected by a particular task) or to the channel itself. Further study of the data should reveal this aspect.
  + **Apply several feature extraction techniques.**
    - This will likely work in tandem with the previous requirement step.
    - Spectral domain features will be the first ones to look at:
      * Fast Fourier transform
      * Short time Fourier transform
      * Wavelet transform
  + **Choose the best feature / features for the problem**
  + **Use the features to train traditional machine learning models in order to provide a baseline for further analysis**
  + **Use the features to train deep machine learning models in order to further the study and test the effectiveness these algorithms have on the problem.**
* **Non- essential objectives (this can be added to):**
  + **Further non-spectral domain feature extraction, this can be based on further research into the existing techniques for both EEG signal and seismic signal analysis.**