

## Implementation Notes:

- Updated the code format to the newly updated Starter Code.
- Updated the structure of collecting accuracy metrics to fit for multiple runs of each of the Classifiers, Traditional, MLP and CNN.
- Changed the loop structure around perform\_traditional method to introduce atomicity into the method as far as which classifier is being run. (Required as it improved data collection and ordering)
- Attempted implementation of Feature Selection however have encountered some bugs which need to be addressed with regards to feats updation.
- Structured parameter passing to make the code independent of standard values.
- Updated the deep\_learning method to handle both the MLP and CNN based on modelKey identifier.

## Key Findings :

```
LOSO Mean Accuracies ----

Classifier: traditional_classifier
  With Projection Test: 64.40%
  With Projection Train: 96.52%
  No Projection Test: 48.07%
  No Projection Train: 96.31%

Classifier: MLP
  With Projection Test: 50.14%
  With Projection Train: 82.41%
  No Projection Test: 53.10%
  No Projection Train: 91.39%

Classifier: CNN
  With Projection Test: 52.20%
  With Projection Train: 89.94%
  No Projection Test: 25.19%
  No Projection Train: 50.66%
```

1. Across all classifiers, generally it can be observed that LDA projection allows the test accuracy to increase or remain similar to non-projection runs.
2. CNN benefits a lot by running with LDA projection, meaning CNN is unable to identify meaningful patterns without projection.
3. The projection is regularizing the data -> removes noisy / subject-specific dimensions, reducing overfitting
4. MLP does not exactly benefit from the projection as much as the others, in fact it degrades signaling that for the current chosen dimensionality, MLP may be experiencing overfitting.