The most recent update is that we ran all of the specified Machine Learning Algorithms on Subject 1 through Subject 10, then averaged the results to see the overall performance.

In this part, we have included four new evaluation parameters: F1 Score for analyzing classification results, Mean Absolute Error, Mean Square Error, and Root Mean Square Error for calculating our error rate.

So, in total we have 5 Evaluation Parameters for Evaluate our Research in depth.

I put the results in an excel spreadsheet. This presentation includes the summary with a bar plot.

here are all of the findings and visualizations associated with the result.

We can see that we have added XG Boost as one of our new algorithms because we can see that all tree-based algorithms, such as decision tree and random forest, perform better, and XG boost is a tree-based algorithm.

Logistic Regression has been removed since it performs badly. The accuracy of logistic regression is in the 60 percent level. We can also observe that Support Vector Machine performs poor compared to other algorithms, since its performance is affected by large amounts of data.

The following step is to complete the Feature Selection Part. As we can see, for each subject, a different feature is chosen as the least significant and redundant feature. That is rather contradicting, as it should be the same feature that is redundant or the least significant.

So, in order to determine the best feature for our model, we have also used different methods of feature selection, such as Recursive Feature Elimination. As a result, every Feature was chosen to provide the best accuracy for our model.

Then we dive deeper and use the Boruta py feature selection to select the correct feature. As the Boruta feature selection suggests, every characteristic is relevant in this case.

So, as suggested by the least significant feature table, I ran the machine learning algorithms. Here are the average accuracy and Root Mean Square Error findings for subjects 1 through 10.

I've also put the results in an excel spreadsheet. So, we can see that each time we execute the feature selection, the accuracy decreases and the error rate increases.

So maybe the recursive feature elimination and Boruta feature selection are correct in that every feature is relevant to us.

The main reason might be that every feature is essential because this is medical data and the signal from each electrode represents something.

The next stage in improving the system is to use feature sampling, hyperparameter tuning, and a deep learning approach. I also did some of the work for one of the subjects.

Here We can see that by tuning it, we can improve the accuracy, and by sampling the feature, certain algorithms perform better than others.

That is all from my end.

The Main Question from today’s meeting is that, whether we should perform the feature selection part

or continue on to the next stage of our model improvement, leaving everything as is and taking all of the EMG Value.