CSE 535 Fall 2019 - Assignment 2

Group 10

For this assignment, we are given metadata created from the video we capture from a person demonstrating a sign language. From this data we try to classify which sign the user showed. We use four different machine learning models to recognize the sign shown by the user.

For training the models we used only the data that was provided in the class. Our models were performing too well in the data that we collected, perhaps due to the fact that all team members had similar height and build. So we used only the provided data. We also anticipated that the provided data and test data are similar.

Before we use the machine learning models we aggregate the data by taking the *mean, standard deviation, minimum, maximum, skew,* and *kurtosis* for each feature. Following this we use f**eature selection** to only use features that are relevant/useful for prediction. After selecting the good features we pass the data to predict using four different models. The models include a **Random Forest, Logistic Regression, Gradient Boosting Machine**, and finally an **ensemble model** of Linear Discriminant Analysis, Extra Trees Classifier, and logistic regression. The last model is a majority voting based classifier.

Since we had less data (<500) we used cross validation to estimate model performance:
Here we are reporting the **accuracy** metric for the five cross-validation folds.

Model	CV 1	CV 2	CV 3	CV 4	CV 5
Random Forest	0.75	0.76	0.80	0.84	0.79
Logistic Regression	0.84	0.82	0.83	0.82	0.85
Gradient Boosting	0.71	0.78	0.80	0.78	0.82
Voting classifier	0.84	0.86	0.88	0.87	0.90

For testing our service, our service url can be called.

The accompanying code is available in notebooks for training and in the python files.