Classification of 5 Different Hand Postures

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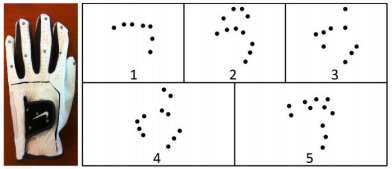
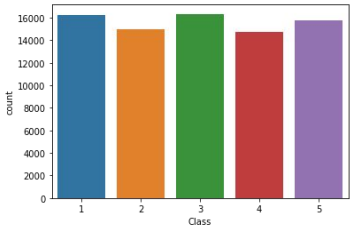
Introduction

The problem that we attempted to tackle was accurately classifying hand posture positions based on a series of coordinates. The use of machine learning to determine hand posture can have a number of real world applications, including sign language recognition. Through the use of classification models, we hoped to successfully use user coordinates to classify hand position.



Data

The data used for this analysis contained 78,096 rows and 38 columns and was taken from UCI Machine Learning. There were no duplicate values; however, missing values were common. There were 5 classes, which would be used as our target.



Results

	SGD Classifier	PCA	Decision Tree
Dropped Missing Values	OvO = 0.42	OvA = 0.56	0.91
Filled with 0	OvO = 0.69	OvA = 0.73	0.96
Imputed Values	OvO = 0.78	OvO = 0.76	0.95

Conclusions

- The OvO model performed the best when using the SGD Classifier.
- Models ran after PCA reduction had better performance overall
- Decision tree was a better classifier than the SGD Classifier
- The classes representing one finger point and two finger point were misclassified most often
- If we had more time, we planned to use interpolation to fill missing values
- Models performed decently well; however, it would be interesting to see how more accurate recordings would impact results