MMT Genre Classification

VJS Pranavasri,Mohit Pavan Kumar
2020121001,2018102016

Task 2:

1. **Feature Selection:**
    a. Spectral Centroid
    b. Rolloff
    c. Flux
    d. ZeroCross

    On a top level view, any classification that has flux as a part of it seems to have a higher effect on the accuracy.

    For each case, the following classifiers are best performers: (All results are in the notebook)

Set1:

Frame Length,stat	Features	Accuracy	Model
0.5,mean	1. ['zecr', 'flux']	0.70	Random Forest
0.5,sd	1. ['zecr', 'flux'] 2. ['spectral_centroid', 'rolloff', 'flux'] 3. ['spectral_centroid', 'zecr', 'flux']	0.38	1. Naive Bayes 2. Random Forest 3. Random Forest
1,mean	1. ['rolloff', 'zecr', 'flux'] 2. ['spectral_centroid', 'rolloff', 'zecr', 'flux']	0.67	1. Naive Bayes 2. Naive Bayes
1,sd	1. ['rolloff', 'zecr', 'flux'] 2. ['spectral_centroid', 'rolloff', 'zecr', 'flux'] 3. ['flux']	0.42	1. Random Forest 2. Random Forest 3. SVC
3,mean	['rolloff', 'flux']	0.69	Random Forest
3,sd	['zecr', 'flux']	0.64	Naive Bayes

Set2:

Frame Length,stat	Features	Accuracy	Model
0.5,mean	[rolloff, 'flux']	0.60	Random Forest
0.5,sd	['rolloff', ‘zecr’, 'flux']	0.41	Random Forest
1,mean	['spectral_centroid', 'rolloff', 'zecr', 'flux']	0.62	Random Forest
1,sd	['spectral_centroid', 'rolloff', 'flux']	0.57	Random Forest
3,mean	['rolloff', 'flux']	0.58	Random Forest
3,sd	[‘rolloff’,'zecr', 'flux']	0.55	Random Forest

Spectral Rolloff and flux seem to be one of the most prominent features, as the higher accuracy all have those features in common.
This is closely followed by **zero crossing** which is a part of the sample having the highest accuracy.
It seemed like timbral features were sufficient for Set1, training the model with tuned parameters would increase accuracy.
Whereas for Set2, I feel rhythmic Parameters would’ve helped more as they feel more close in terms of how they sound.

2. For both sets:
    a. Set1, Frame length of 0.5 gave the highest accuracy of 0.70
    b. Setr2, Frame length of 1 gave the highest accuracy of 0.62

   A general trend to note is that standard deviation is almost always giving a much lesser accuracy than mean. This seems fairly correct as deviation from mean, cannot tell us about the feature but rather the dispersion of values within.
3. Using the default configuration of each parameter, we can see that in almost every case, Random forest has given the highest accuracy.
   From my understanding, Random Forest builds multiple decision trees and takes into account the majority votes, in this case we try to classify over multiple features, and by nature RandomForest works the best without any hyper tuning of parameters. Hence we receive higher accuracy on Random Forest