Project: Part 0
EECS 207
Spring 2025
Version 4/20/25 (9pm)

Run the following Notebooks in this order:

1) Compute_Spectrograms.ipynb

   This will compute spectrograms of the 171 .wav files. Each recording is ~1 minute

2) Compute_ROIs.ipynb

   This will extract the spectrogram regions of interest (ROIs) corresponding to 218 bird calls (for five birds). These regions will be saved as files. Information about the start time, end time, lower frequency, and upper frequency bounds of the 218 calls are in the files DEJU - Junco hyemalis.csv, etc. (One file for each bird.) These ROIs were manually labelled by bird call experts.

3) Compute_Mean_Std_features.ipynb

   This will extract two dimensional (mean, standard deviation) features from each of the 218 ROI images.

4) Compute_Gabor_texture_features.ipynb

   This will extract Gabor texture features from each of the 218 ROI images. The following two variables determined the number of orientations and the number of scales in the filter bank:

   - nscales
   - norientations

   Run this Notebook twice, once with nscales = 2, norientations = 3, and once with nscales = 3, norientations = 4

5) Perform_query.ipynb

   This will perform a complete set of queries for a particular feature. The type of feature is determined by the variable:

   - feature_type

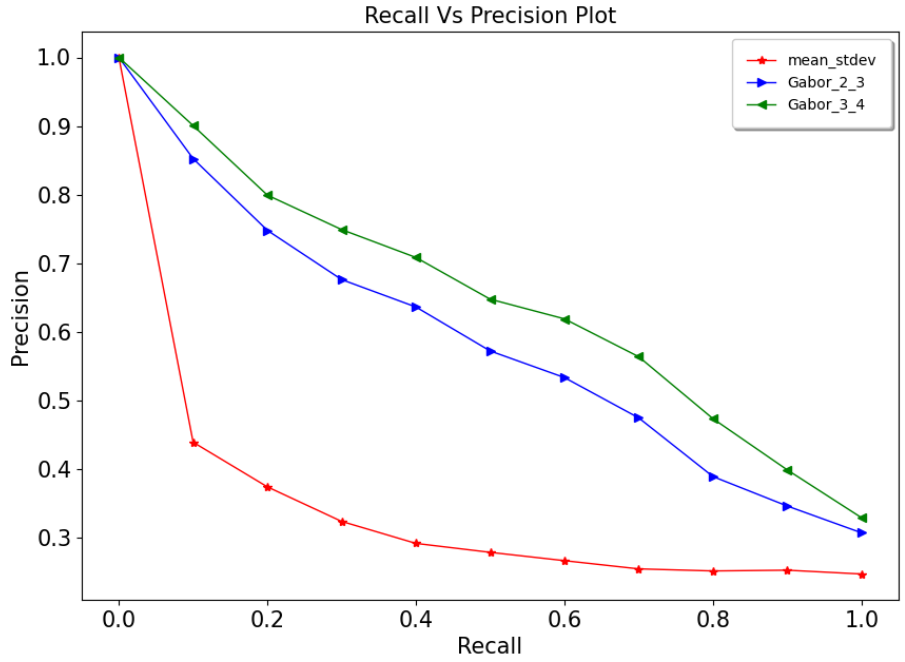
For example, if feature_type='mean_stdev' then this will perform 218 queries with each image serving as the query and all the images as the targets. The distance between each query and the all the images will be computed with respect to the two dimensional (mean, standard deviation) features.

Run this Notebook three times, for feature_type equal to 'mean_stdev', 'Gabor_2_3', and 'Gabor_3_4'.

6) Plot_precision_recall.ipynb

This will plot the precision recall curves for the three features extracted above. It will also compute the average precisions.

After the above, you should get the following plot:



And, you should get the following average precision values:

```
       Average Precision Values
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mean_stdev = 0.3610683856099536
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Gabor_2_3 = 0.5936605266352992
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Gabor_3_4 = 0.6531722268331103
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