

Final Project (due 5/3 at 1 pm)

Given a training and testing database consisting of the spoken words from multiple people saying “yes” and “no” and other arbitrary words or sounds, build a 3-state classifier that will open the file and indicate which word was spoken or if neither word was spoken. The output of your classifier is either “YES”, “NO” or neither.

A training and testing database consisting of 55 samples in each class is provided in a zip file on canvas.

1. Develop the classifier through training and testing with the data from this set. When completed, **submit a short report describing the classifier used (features, structure, and thresholding/decision process, bootstrapping) and the results from your testing in terms of recall and precision for each class** (It would be best in hand in a table of the confusion matrix with the associated performance values in the final row and column for each state that result from your test). Your commented code should be in an appendix. Upload the report to canvas. **18 points**

2. Then submit mfiles required to implement your classifier on a similar database and display the performance (files are named with the same pattern; however, the number of files in each class may be different from the database you have). Performance should be in terms of a confusion matrix with performance values (recall and precision) in the last row and column as described in Part 1. Zip up all these mfiles and name the main script for running through a database and computing classifier performance **runme.m**. There should be a few lines that I can modify the change the number of files it will open up and test performance. Note this script only implements your final classifier. A training phase should not be run in this case, nor the database partitioned – all files are used in the test.

The result of the program is a 4x4 matrix with the:

first row (first 3 columns) summing up to the number of times a detected “Yes” occurred
second row (first 3 columns) summing up to the number of times a detected “No” occurred
third row (first 3 columns) summing up to number of times neither were detected
the forth row being the recall metric in percent for each case

The columns would be analogous to the rows except they represent the true/correct occurrences over the testing and the last column is the precision.

I should then be able to copy your mfiles to another directory with similarly labeled files (but up to 75 files for each class) and run it to obtain the resulting confusion matrix for this new data. **3 points**

An example of this confusion matrix with performance values is shown below:

	YES	NO	Neither	% Precision
Classified-YES	21	9	14	48
Classified-NO	4	12	6	55
Classified-Neither	10	14	15	38
% Recall	60	34	43	0

