Part 2: Step-wise Classification

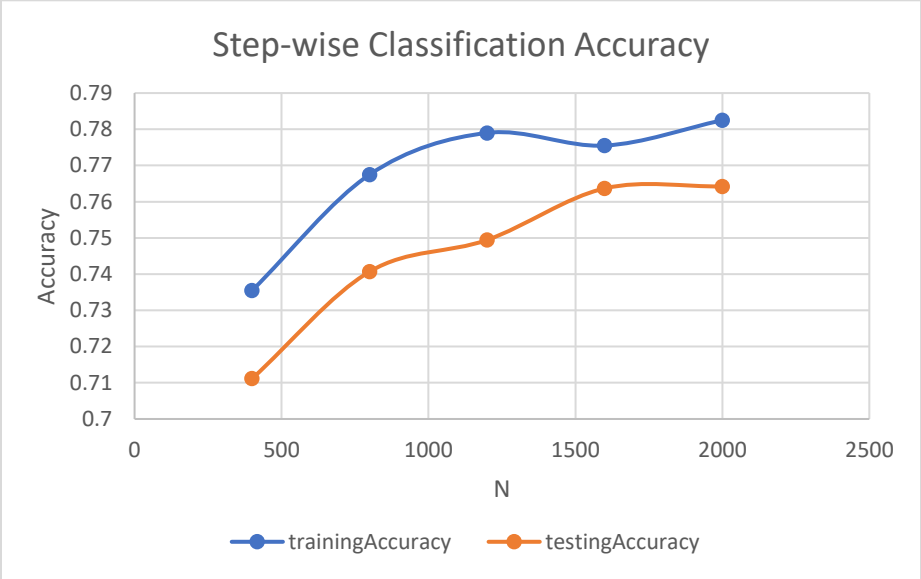
The code is written in homework1_smile_rhuang2.py

4. Testing result

Table:

n	trainingAccuracy	testingAccuracy
400	0.7355	0.71116
800	0.7675	0.7407
1200	0.779	0.749453
1600	0.7755	0.763676
2000	0.7825	0.764223

Plot:



As the table and figure shows, when N increases from 400 to 2000, the accuracy of classification increases for both training and testing set. When N = 1600, the training accuracy goes down, but testing accuracy increases a lot. Therefore, more images for training gives us more accurate classification in general.

5. Visualization of Features

The following figure shows the features learned from 2000 training images.

The number is used to distinguish between different pair of features.