ECE 763
Project 01
Face Image Classification
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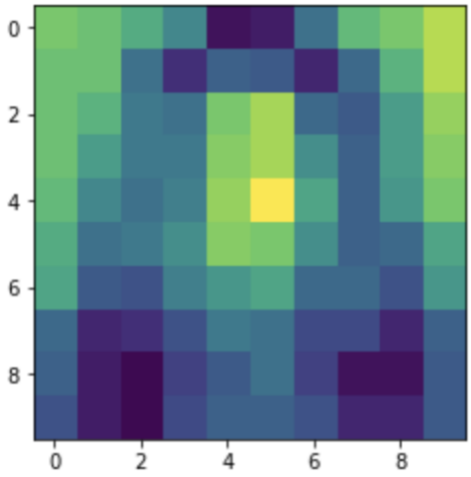
Data Preparation

The training data set was prepared using 1000 face images. The training dataset for non face images was created by cropping a 10*10 image from the background of the face images.
The testing data set was created using 100 images for face and non face each

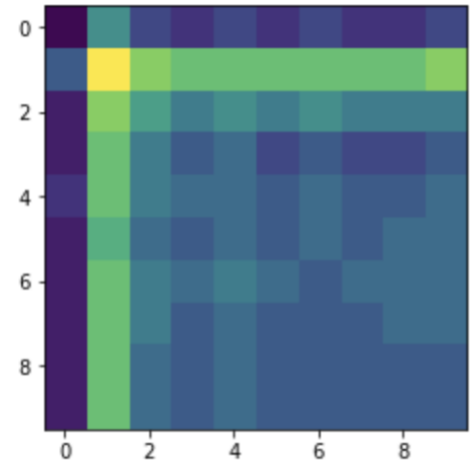
Model 1
Single Gaussian Model

-Visualization of the estimated mean and covariance

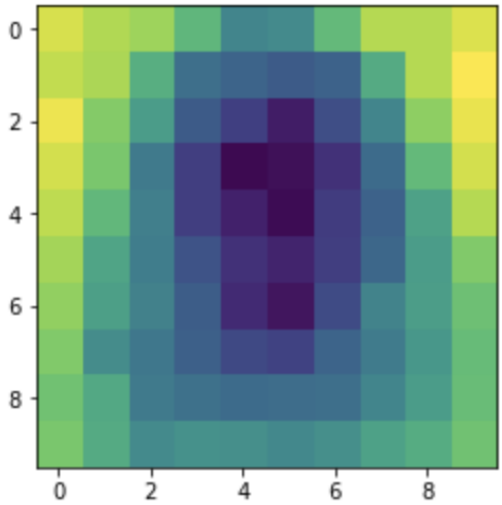
Estimated mean for images with face



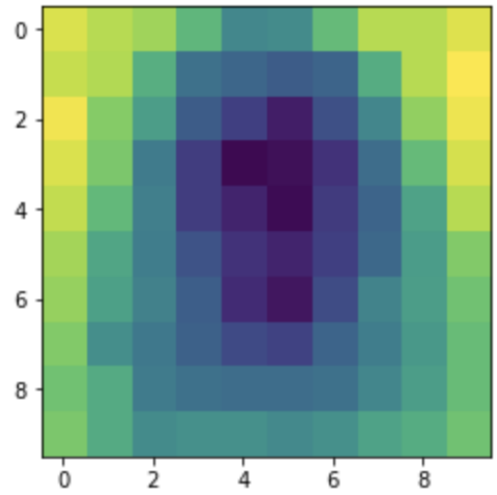
Estimated mean for non face images



Estimated covariance for images with face



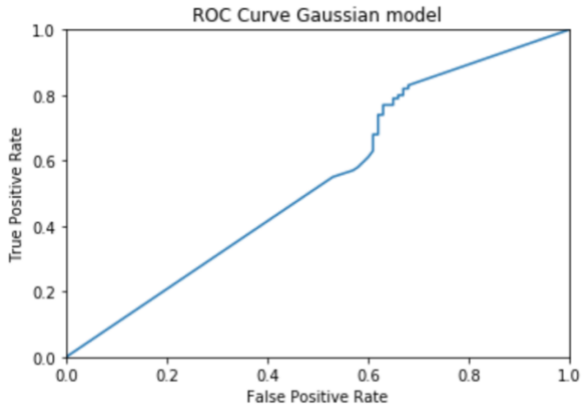
Estimated covariance for non face images



-Testing the model

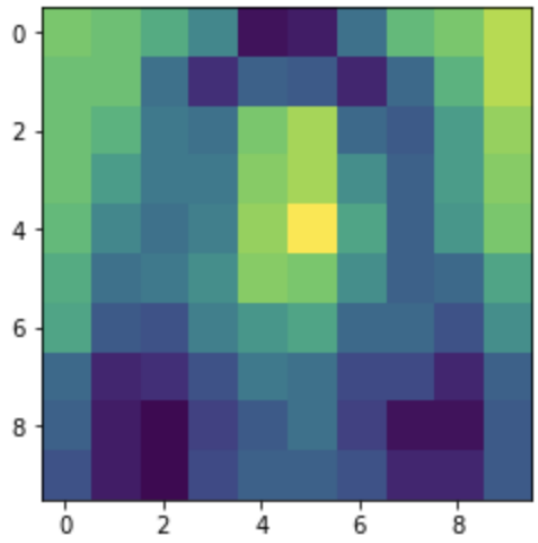
On testing the model
The false positive rate was found to be 0.63
The false negative rate was found to be 0.24
The misclassification rate was found to be 0.435

-ROC Curve

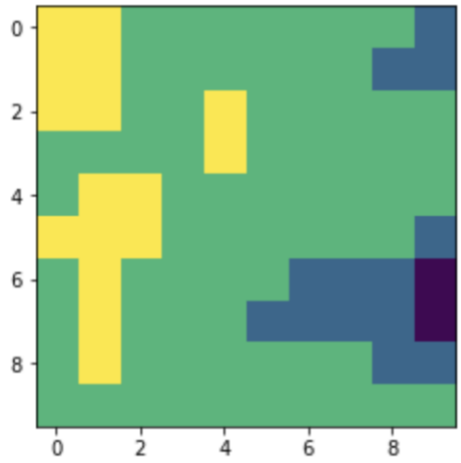


Model 2
Mixture Of Gaussians

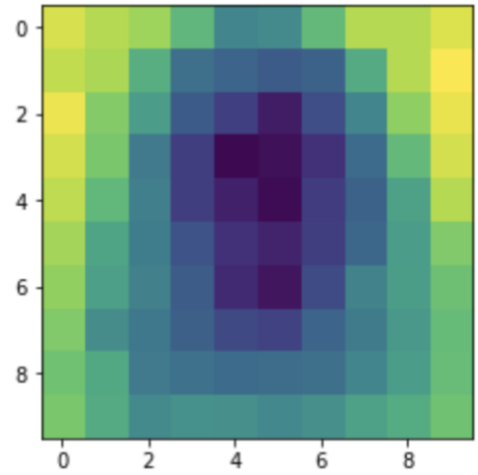
-Visualization
Estimated mean for face images



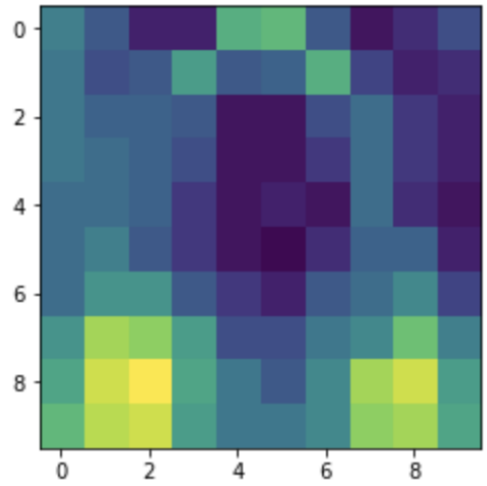
Estimated mean for non face images



Estimated covariance for face images



Estimated covariance for non face images



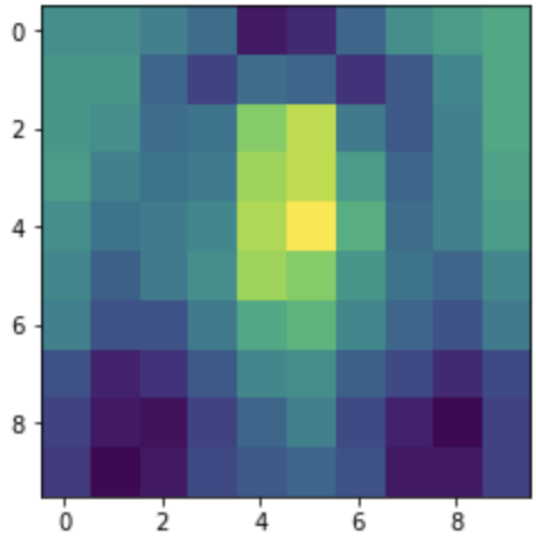
-Testing the model

On testing the model
The false positive rate was found to be 0.38
The false negative rate was found to be 0.325
The misclassificartion rate was found to be 0.3525

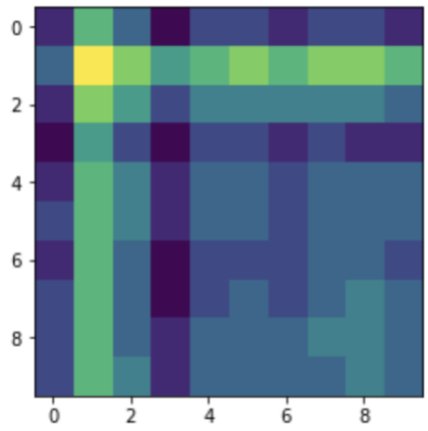
Model 3
t-distribution

-Visualization of the estimated mean and covariance

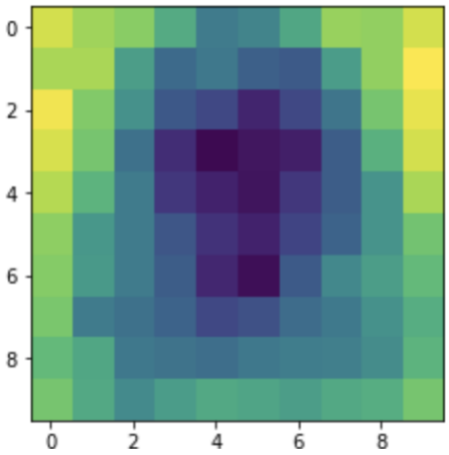
Estimated mean for the face images



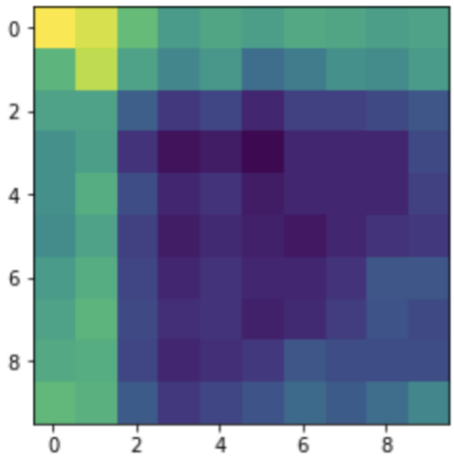
Estimated mean for non face images



Estimated covariance for face images



Estimated covariance for non face images



-On testing the model
The false positive rate was found to be 0.22
The false negative rate was found to be 0.04
The misclassification rate was found to be 0.13

-ROC Curve