ENGR 421 – HW3 – Report

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Implementation:

First of all, I assigned every images in hw03\_data\_set\_images.csv and labels in hw03\_data\_set\_labels.csv to training sets and test sets. The training set has the first 25 images and labels of each class and the test set has the remaining 14 images and labels.

After that, because of the labels are in alphabetical order, I assigned all of the letters to numbers. I assigned A as 1, B as 2, C as 3, D as 4 and E as 5.

Later, I took the means of each image train data. These were the pcd values that estimation. The values can be seen below.

Table

Description automatically generated

Then I took the p1, p2, p3, p4, and p5 values that are greater than class priors put it in a matrix. After that I matrix multiplied it with image train data. After that I rotated the result matrix by 90 degress and plotted their parameter estimations as images. Those images can be seen below.

Text

Description automatically generatedA picture containing graphical user interface

Description automatically generatedA picture containing histogram

Description automatically generatedA picture containing graphical user interface

Description automatically generatedA picture containing chart

Description automatically generated

A picture containing text

Description automatically generated

After the plot, I calculated the confusion matrix for the train data and the result is in the left.

A picture containing calendar

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Last but not least, I predicted the y values for the test data by taking the p1, p2, p3, p4, and p5 values that are greater than class priors put it in a matrix. After that I matrix multiplied it with image test data. Then, I calculated the confusion matrix for the test data and the result is in the left.