

# Computer Vision

## Fall 2021

### Problem Set #6

First Name Last Name

Email Address

# 1a: Average face



ps6-1-a-1

# 1b: Eigenvectors



ps6-1-b-1

# 1c: Analysis

Analyze the accuracy results over multiple iterations. Do these “predictions” perform better than randomly selecting a label between 1 and 15? Are there any changes in accuracy if you try low values of  $k$ ? How about high values? Does this algorithm improve changing the split percentage  $p$ ?

I think

my answer is ...

# 2a: Average accuracy

Report the average accuracy over 5 iterations. In each iteration, load and split the dataset, instantiate a Boosting object and obtain its accuracy.

I think

my answer is ...

# 2a: Analysis

Analyze your results. How do the Random, Weak Classifier, and Boosting perform? Is there any improvement when using Boosting? How do your results change when selecting different values for num\_iterations? Does it matter the percentage of data you select for training and testing (explain your answers showing how each accuracy changes).

I think

my answer is ...

# 3a: Haar Features



ps6-3-a-1

# 3a: Haar Features



ps6-3-a-2



# 3a: Haar Features



ps6-3-a-3

# 3a: Haar Features



ps6-3-a-4

# 3a: Haar Features



ps6-3-a-5

# 3c: Analysis

How does working with integral images help with computation time? Give some examples comparing this method and `np.sum`.

I think

my answer is ...

## 4b: Viola Jones Features



ps6-4-b-1

## 4b: Viola Jones Features



ps6-4-b-2

# 4b: Analysis

Report the classifier accuracy both the training and test sets with a number of classifiers set to 5. What do the selected Haar features mean? How do they contribute in identifying faces in an image?

I think

my answer is ...

# 4c: Viola Jones Face Recognition



ps6-4-c-1



# 5b-1 Extra Credit: Cascade Classifier

Report the cascaded classifier accuracy on both the training and test sets. What was the best percentage for the train/test split? What values did you choose for the false positive target, the false positive rate, and the detection rate? What impact did these have on the overall cascaded classifier?

I think

my answer is ...

# 5b-2 Extra Credit: Cascade Classifier

How many classifiers did your cascade algorithm produce? How many features did each of these classifiers have? Compare this classifier to just a single Viola Jones classifiers.

I think

my answer is ...

# 5b-3 Extra Credit: Cascade Classifier

## Face Recognition



ps6-5-b-1