

Algorithm:

These k's are chosen based on hit and trial.

Do this for k in [1, 2, 3, 5, 10, 15, 20, 23, 25, 27, 29, 30, 50, 75, 100, 150, 170]

1.) Cross-Validation to find the threshold error for each person

We have been given 6 images per person in the training set. We divided it into train and validation sets. Train set consists of 5 images and validation set consists of 1 image.

So there are 6 sets of train and validation set :

{1,2,3,4,5} {6} => error_1

{2,3,4,5,6} {1} => error_2

{3,4,5,6,1} {2} => error_3

{4,5,6,1,2} {3} => error_4

{5,6,1,2,3} {4} => error_5

{6,1,2,3,4} {5} => error_6

error_i is a list of difference of squared errors between validation image and train image. Each element in error_i represents the error when there is a correct recognition.

thresholding_person_specific = []

For j in length(error_i):

thresholding_person_specific = max(error_1[j], error_2[j], error_3[j], error_4[j], error_5[j])

Now test phase starts:

for each person in the test set:

for each person in the train set:

for images present in the database.

if squared error < threshold and it's label matches with the label in the train set.

then there is a match in the database.

for images not present in the database

If squared error < threshold of current person in the train set.

then there is a mismatch i.e. it is falsely recognising the image.

Return the value where correct_prediction is max or false positive is min.

Best False Negative is for k = 25, it is 41

Total number of correct prediction = 163 out of 208 images.

For detailed implementation of the algorithm, please visit the code :)