Introduction to Multimedia Technology HW01 - CSIE 4B 408410120 鍾博丞

Environment Requirements

MATLAB R2020a - for `exportgraphics()`

Image Processing Toolbox - for `histeq()` (histogram equalization), `ordfilt2()` (order statistic filter).

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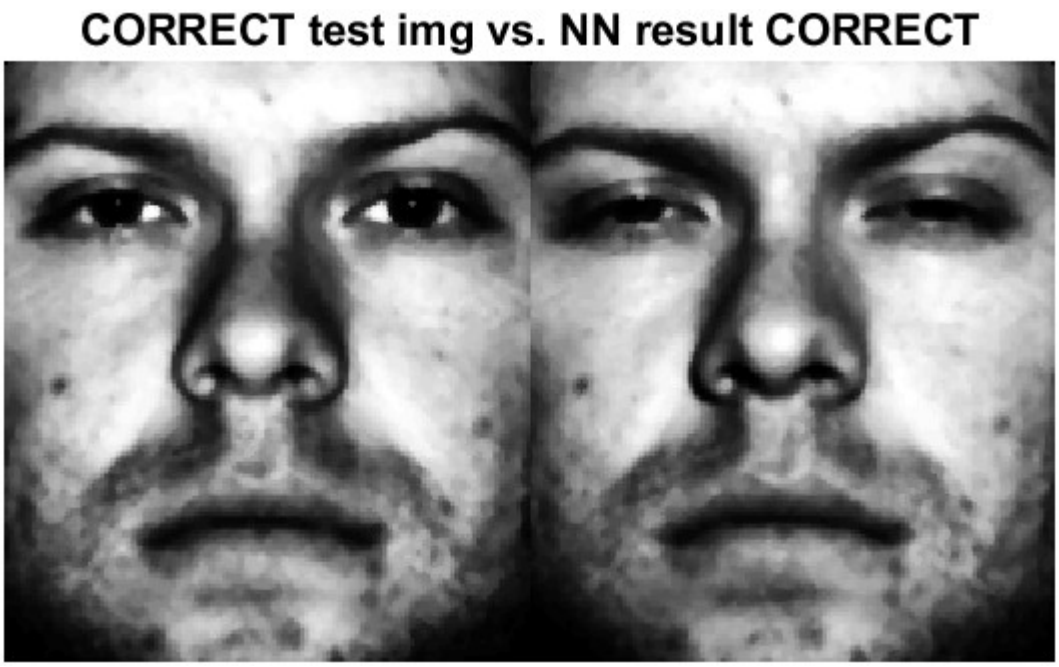
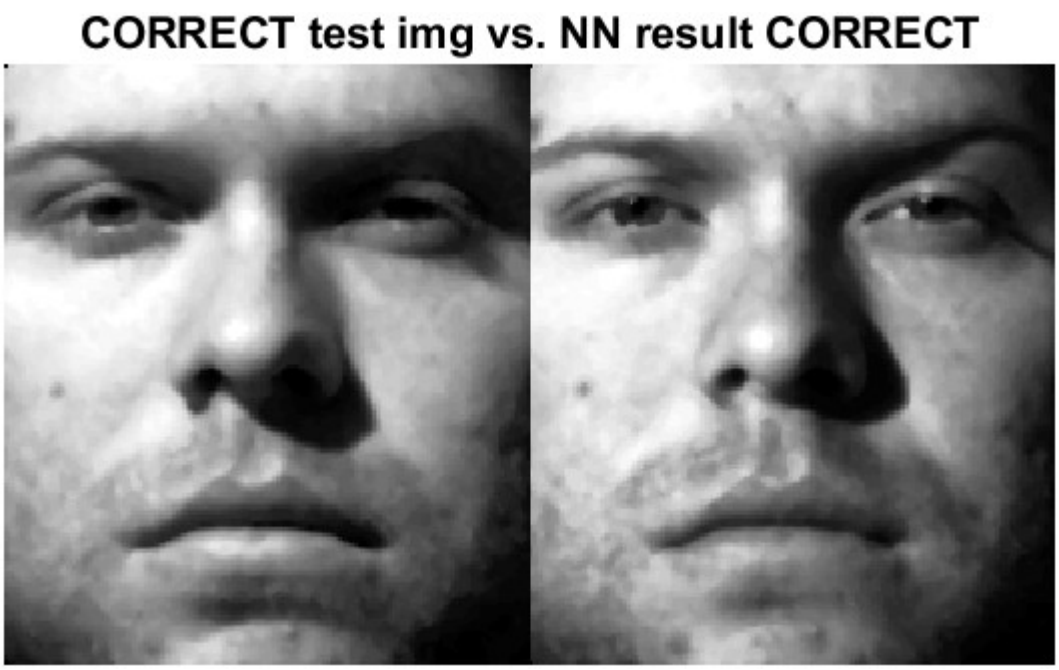
Find Nearest Neighbor

Result

Our result is extraordinary, we have reached an average of **90% accuracy** for the testing dataset using **SAD** in this project.





CORRECT test img vs. NN result CORRECT

CORRECT test img vs. NN result CORRECT

CORRECT test img vs. NN result CORRECT

Implementation

We remove all the "Ambient" `.pgm` file because it is unnecessary and the size is 480 * 640 instead of 192 * 168.

Two image processing methods are used in image preprocessing.

- Histogram equalization
    - In order to enhance some images that look very dark.
- 3*3 median filter
    - In order to remove salt-and-pepper noise.

The **SAD** (Sum of Absolute Differences) is used in this project.

The function `createns()` in MATLAB is to create the nearest neighbor searcher object.

We specify the Name-Value argument "cityblock", which is the implementation of SAD.

Discussion

- Image preprocessing plays an important role in this project.
- If we use the original image directly, then the accuracy will be only 60%.