CSCI 5561 (Computer Vision)
Homework 1 Summary

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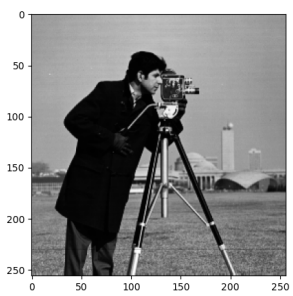
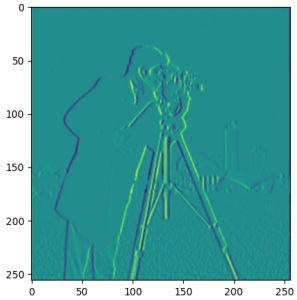
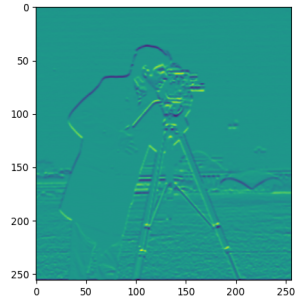
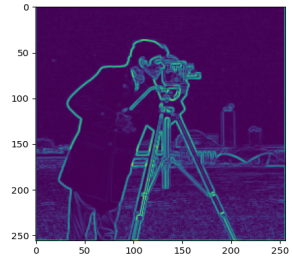
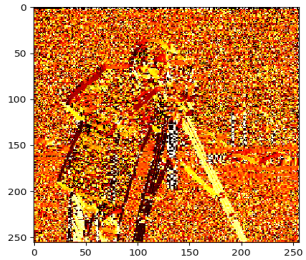
Below are the steps for implementing HOG and applying it for face detection.
For HOG:

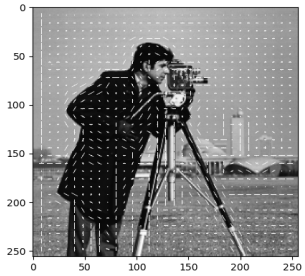
1. Initially, the image is filtered using Sobel filters along the x and y directions.

2. Then the magnitude and the angle of the gradient are calculated.

3. Now we calculate the histogram of oriented gradients for each cell of size 8 by summing the magnitudes corresponding to the range of angles of each bin.
4. The above-constructed hog is locally normalized for each block of size 2.



For face detection:

1. Calculate the HOG of the template image and now correlate it with the HOG of each patch of the target image (patch size = size of the template image). Now threshold these NCC values.
2. Now apply non-maximum suppression by using IoU 0.5 to get the faces