

CS682 : Homework #3
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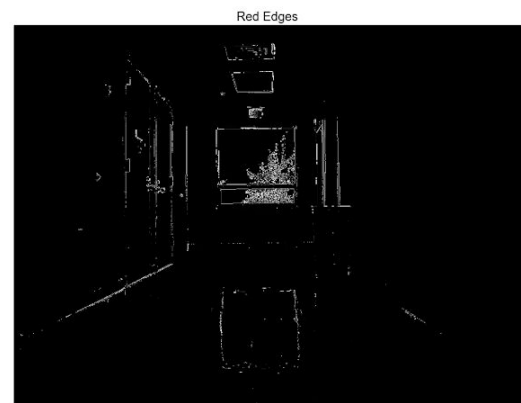
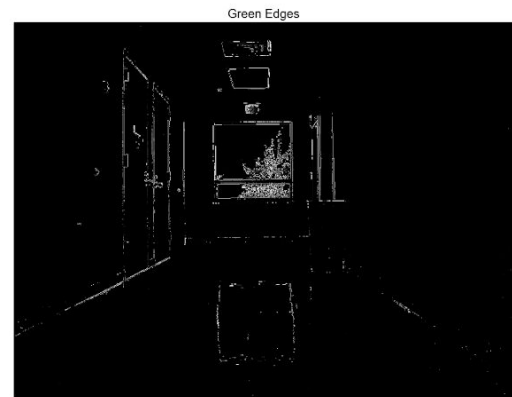
1. Gray and color edges for image ST2MainHall4052.jpg

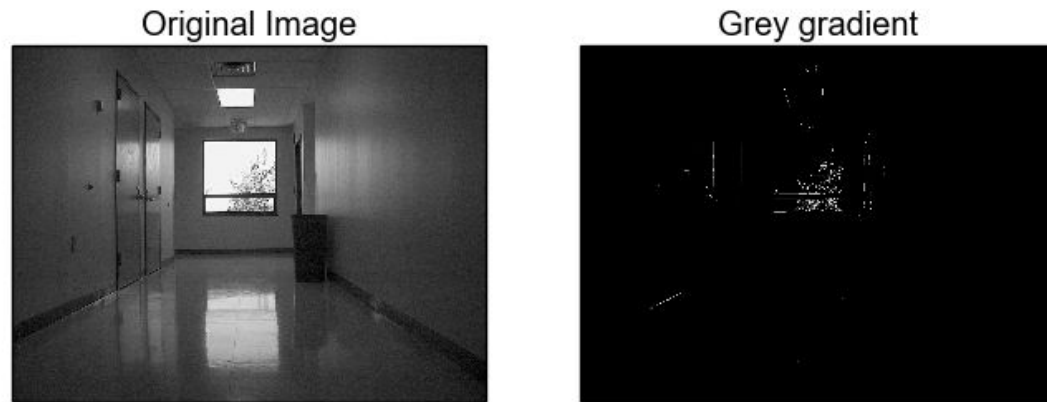
I used Canny Edge Detector on the image (in grayscale and color mode).

For grayscale, I used parameters, threshold1=400, threshold2=400.

For the RGB image, I split the 3 channels and used threshold1=200, threshold2=200.

I use the same parameters for all 99 images.





2. Gray Edge Histograms

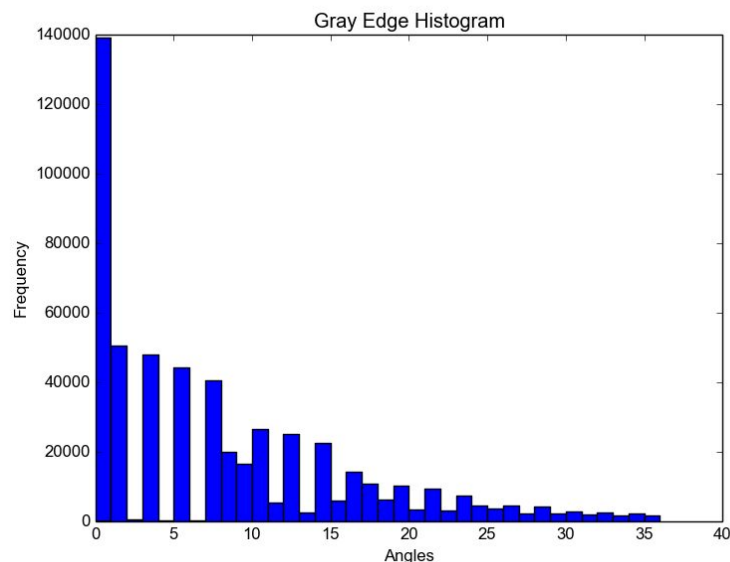
I calculated the gradient for each image using the `gradient` method in Numpy. Then, using the x and y components of the gradient, I calculated the magnitude and angle as follows -

$$\text{Magnitude} = \sqrt{g_x^2 + g_y^2}$$

$$\text{Angle} = \arctan2(g_y, g_x)$$

Where g_y and g_x are the y and x gradients.

Then I converted each gradient to a value that falls into one of 36-bins and plotted the histogram for all images. One sample is shown below for the image ST2MainHall4052.jpg.



3. Color edge histograms

I split the images into R, G and B channels. Then I used the Canny edge detector to select edges. The thresholds used are threshold1=200, threshold2=200. Then I calculated the magnitude, $m = |r_x| + |g_x| + |b_x| + |r_y| + |g_y| + |b_y|$ and $u = (r_x + g_x + b_x, r_y + g_y + b_y)$.

4. Histogram comparison functions

I reused the functions I wrote for Homework #2.

5. Comparison of all 99 images

