CS 7650 – Digital Image Processing

Assignment 5 – Edge Detection

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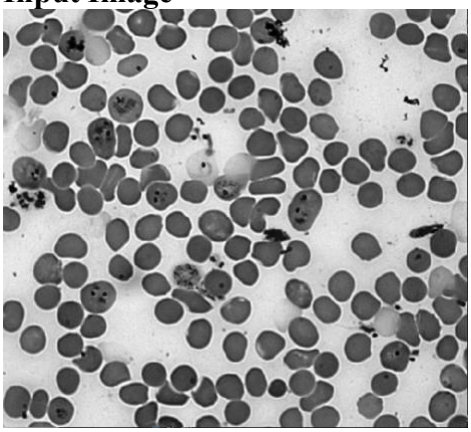
Abstract

The purpose of this assignment was to gain an understanding of edge detection by using the Sobel filter to calculate the angle, magnitude, and images under Sobel.

PART A

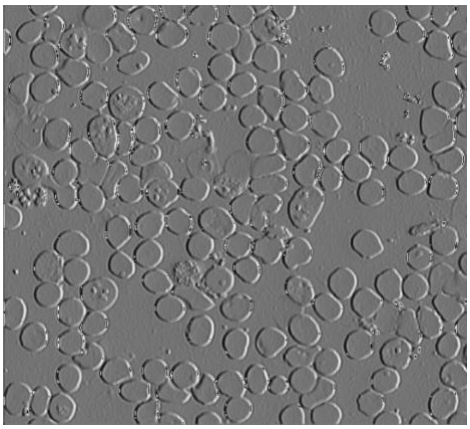
Apply each Sobel filter (Gx and Gy) in normalized form shown below) to the sample test images below and display the (scaled) output gradient images (Ix and Iy).

Input Image

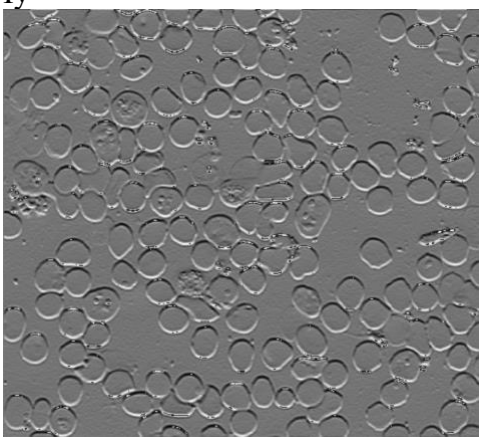


Output

Ix



Iy

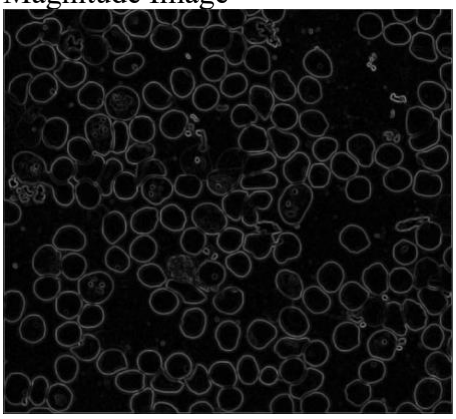


PART B

Compute the magnitude of the edge response by combining the output from the Gx and Gy filters.

Output

Magnitude Image

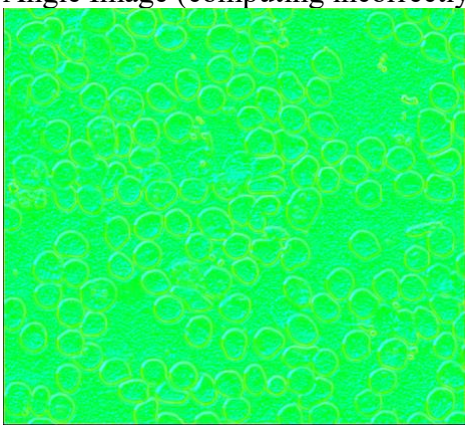


PART C

Compute the orientation of the edge response by computing the angle of the edge gradient

Output

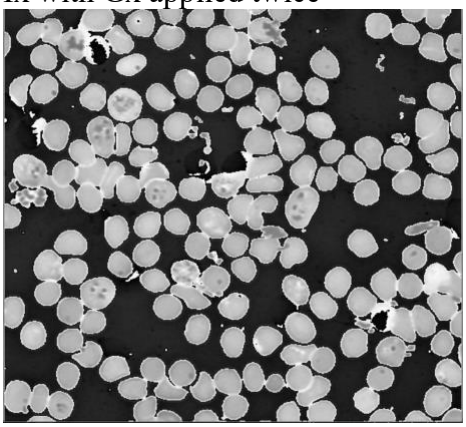
Angle Image (computing incorrectly)



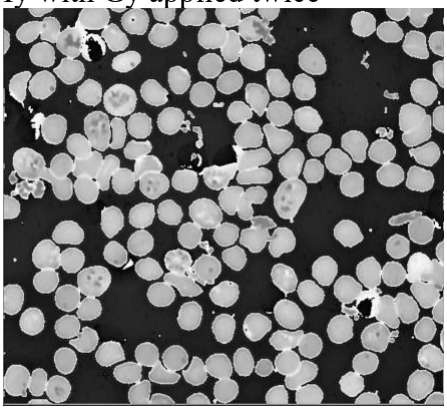
PART II- GRADUATES ONLY

Output

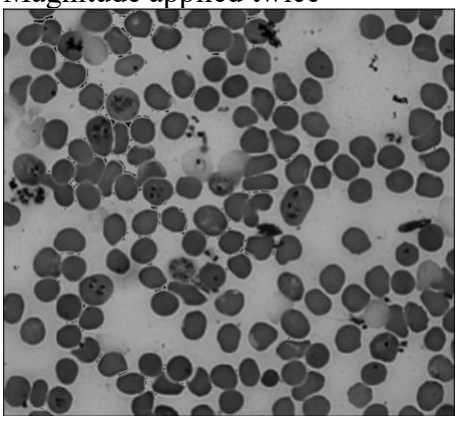
Ix with Gx applied twice



Iy with Gy applied twice



Magnitude applied twice



ISSUES

- Did not implement reading in RGB images. I would do basically the same thing in all three channels if I had more time.
- Was unable to get the angle image to display correctly. I believe this has something to do with my magnitude calculation, but I was unable to figure out the problem.