HW0: Increase Intensity, Binarize, and Scale

Daniel Sawyer U3363-7705
CAP5400 Image Processing Fall 2019
University of South Florida, Tampa

I. Introduction and overall description

This assignment focuses on basic image manipulation by increasing intensity, thresholding/binarization, and scale. Adding intensity is just increasing the 8-bit value by a set amount. Image thresholding/binarization compares pixel values with a user defined threshold. In this case, if the pixel value is less than or equal to the threshold, it is set to white. If it is above the threshold, its set to black.

II. Description of algorithms

Increases intensity or checks value and sets black or white whether its less or greater than the threshold value.

A. Gray Scale Thresholding

This algorithm just runs through all of the pixels within the ROI and checks their value against a user defined threshold T. If pixel value is less than or equal to T, then the pixel value is set to white/255. If it is greater than T, the value is set to black/0.

III. 3.Description of implementation

The entire code is developed in C++ language on Ubuntu 18.04 and USF's FSPrime linux server. The code for reading and writing the ppm and pgm image files is provided as part of the image class file. The utilities class file contains all 3 process that were described in this report above.

IV. Description and Analysis of Results

A. Description of Results

Increasing the intensity made the image brighter, binarization turned everything black and white depending on the threshold value, and scale makes larger and shrinks. Pretty standard stuff.

V. Conclusion

This assignment was used as a way to learn how to perform basic image manipulation. The basics of thresholding/binarization and are simple manipulations that are at the core of image processing. The thresholding can be used to bring certain parts of the image to the forefront and scale, scales it. All of these processes help build our basis for future image processes that will come in this class. The Understanding of these basic techniques are important for learning more complex processes to come.

References

[1] Example Project Code and Example Report from TA website.