EE225B Homework 5

due on 02/13/2019 12:00pm; submitted through Gradescope

PROBLEM 1:
A problem frequently encountered in image processing is dealing with variations in lighting conditions. Often, the first step in any image processing algorithm is to adjust the brightness and contrast of the image. But what happens if a scene contains areas of both high contrast and low contrast, and both high brightness and low brightness? In this assignment, you will address this problem.

Assignment specific:

On the website, there is a file Berkeley.jpg (download from: https://inst.eecs.berkeley.edu/~ee225b/sp19/homework//Berkeley.jpg), which is a 1024x768, 256 - grayscale image of downtown Berkeley taken on a bright sunny day. Unfortunately, the image was taken in the shadow of a building and the not-so-great camera couldn't compensate for the bright blue sky and the dark shadow simultaneously. As a result, the sunlight areas are a glaring white, and the shadow areas are dark and low contrast. Using the image enhancement techniques covered in class, increase the contrast and the brightness of the dark areas, and reduce the brightness of the sunny areas. Your goal is an image which looks like it might be taken at noon on a cloudy day. Make a print out of your enhanced image and submit it along with a lab writeup in class on the due date. The writeup should describe in detail the technique(s) which you applied. You will be graded in part on the quality of your enhanced image, so do your best!

PROBLEM 2-5:
Project 3.3, 3.7, 3.8, 3.9. (from 4th edition of Gonzalez and woods)

Note:

1. For each problem, you need to:
    a. Email your source code (**zip** it before you email) to **ee225bsp19@gmail.com** if the question asks for any implementations.
        i. Make sure it is executable because I need to run your code to give you a score. Either MATLAB or Python is okay. Please avoid C/C++ if possible (appreciate it!).
        ii. Email title: FirstName_LastName_HW#. For example, Luya_Zhang_HW1
    b. Submit a **single** PDF file (not word or other formats) on Gradescope which contains:
        i. your answer for each problem;
        ii. your source code (please also paste your source code here; screenshots are okay);
        iii. your output image.

    Make sure to prepare your solution to each problem on a **separate** page. On Gradescope, please select and match each page to the corresponding problems.
2. Please also read the class website carefully about the homework policy.