Assignment 4

Due 8/03/2018

The objective of this assignment is for you to become familiar with the basic image operations. Select you choice of image processing environment: MATLAB or OpenCV.

1. Camera Calibration (50.0%)
Using any calibration toolbox (OpenCV or MATLAB) print the recommended calibration target and perform camera calibration for a camera (web cam, cellphone cam, digital point and shoot camera, or DSLR. Ensure that images are captured in all possible orientations to cover the field of view. Produce a write up in the report for the intrinsic parameters together with the error estimates and examples of the images used in the calibration procedure.

2. Line Detection (50.0%)
Take some pictures with clearly identifiable lines. Use you edge detector to find edges and threshold the image. Use the Hough Transform to detect lines by first examine the counts of accumulator cell for high pixel concentrations and then For each chosen cell, link the pixels based on the continuity.

3. Line Detection in Color Images (Grad Credit)
Obtain color images with edges in the primary colors. Use the Line Detection of Q2 on each separate channel to detect red, green, and blue lines.

What to Submit
Please together with your code provide a report discussing your implementation together with some illustrative examples (screen shots). The report will be the primary product of this assignment. Ensure that is well written and formatted. Document your work in images and use captions to describe what each image displays. Use of LaTeX is encouraged.