Assignment #3
CS510 Spring 2013
"Feature Extraction"
Report Due Wednesday, April 17th

Introduction

The first half of the course we looked at image-based matching techniques. Now we are looking at feature-based techniques. Therefore your third programming assignment is to (1) collect algorithms for extracting at least four types of features; (2) test them on images of your choosing; and (3) write a report describing the advantages and disadvantages of each.

In particular, you must find at least one algorithm for extracting interest points, at least one algorithm for extracting straight line segments, and at least one algorithm for dividing images into regions. You also need to select at least one other feature. Possible features include but are not limited to corners, circles, parabolic arcs, or ellipses. Your fourth feature may also be a second version of point, line or region extraction, for example texture-based (as opposed to color-based) segmentation. Your algorithms may be in OpenCV, but do not have to be.

The goal of selecting test images and writing the report is to learn the strengths and weaknesses of each algorithm, so that you can use them in programming assignment #4. For example, what types of points does you interest point operator extract, and why? What makes it work better or worse (and by what measure)? Note that the analysis is more important that the choice of algorithm. Note also that the only features you may use in programming assignment #4 are the ones you present here in assignment #3.

Data
Pick a small number of test images that let you learn about your feature extraction algorithms. For example, if you are testing a circle extractor, make sure there are circles in your test images!

The Report

Put all the figures are the end of your report. You may include as many figures as you want, but the text of your proposal can be no longer than 4 pages (11 point font, 1 inch margins).

Submission

Submit your assignment by emailing it to me (draper@cs.colostate.edu). Send me an email with Assignment #2 in the heading and attach a single tar file to it. The tar file should contain your report and your test images. The report is due Wednesday, April 17th. There is always an exception for unforeseen emergencies (e.g. death of the family member, severe illness, etc.), in which case see the instructor. Note that machine/disk crashes do NOT count as a unforeseeable emergency.

Hints

Visualize your results.