ELEC 474

Machine Vision

Lab 3

Circle RANSAC

February 5th/6th, 2018

Implement (from scratch) a RANSAC circle extraction routine. First, load an image, (if it's a colour image) convert it to grey scale, and generate a binary edge image using Canny edge extraction. Then execute your RANSAC circle extraction method on the edge image to detect the single most significant circle in the image. Display this lines, either overlaid (in colour) in the original or edge image, or in a separate image.

Test your routine on a variety of images, including **`circle.jpg`**, **`concentric_circles.jpg`**, and (the Canada 150 entry) **`parliament_clock.jpg`** .

Once you have your basic routine running, implement some additional computational features to improve the efficiency of the method. Compare the number of iterations that are required for the original and the improved version.

At the end of the lab, show your results to a TA to get a mark.

Marking Scheme:

Pre-lab:	2 marks
Basic Ransac:	5 marks
Improved Ransac:	3 marks
TOTAL:	10 marks

Notes:

1. An easy way to generate random numbers is using the OpenCV RND class. If you initialize a global RND object, then it can be called anywhere in your module and it will retain its history.

2. The course notes (Lecture 6) contain all of the algebra required to generate a circle expression from 3 points.

3. You have until the beginning of the next lab (week 7) to achieve full marks. After that, there will be a late penalty of 2 marks per week deduction.