Question 1 (MATLAB implementation): The objective of this assignment is to find circular objects in an image (with variable diameter) using Hough transform. Write a program that takes as an input a gray-scale image, and outputs the center and radii of all circular objects found. You are to output only one hypothesis per object, hence circles that are close co-centric (i.e. have the same center within whatever you deem as reasonable tolerance, and are not radically different in size) should be grouped together in your output since it is likely that they arise from the same object. Your program should also display the output image and draw the located circles on it.

Attached to this assignment are 2 images im1.png (easy) and img2.png (hard).

You can start by using synthetic images with only one or two perfect circle to debug your code.

You are permitted to use MATLAB low-level operations (e.g. image i/o, graphics, edge detection, etc.) but NOT the Hough transform operation itself.

Submit your code and your test images with results from your code.

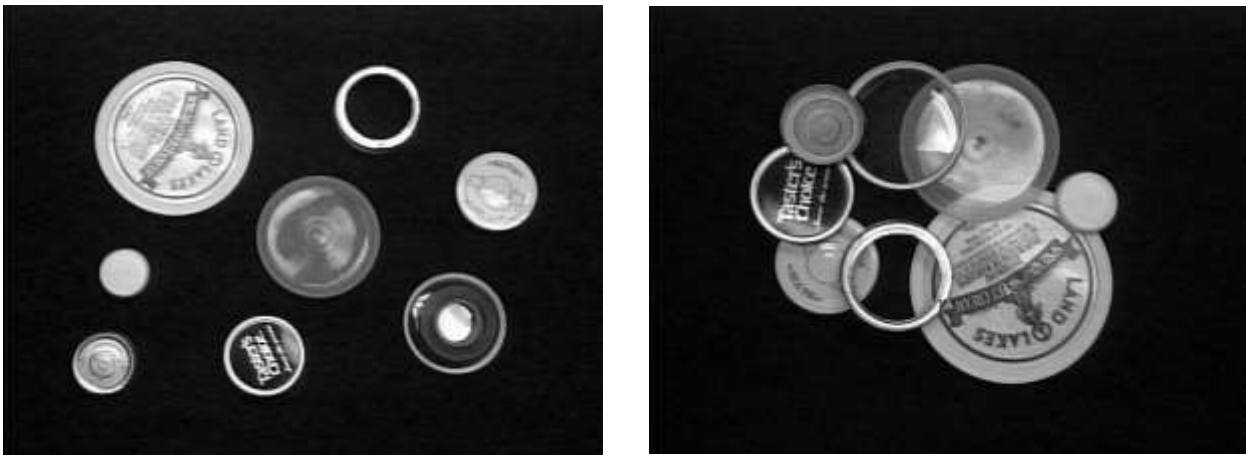

Figure 1: Test images

Instructions:

Assignments and lab reports are submitted as groups of 3 and hence, first you have to join one of the groups in D2L.

General guidelines for programming assignments:

The marking of the implemented functions is based on the following general scheme:

- Correctness and logic 80%: the program logic should be correct and code is compiled without errors.
- Style 10%: codes should have comments and properly formatted.
- Optimization and simplicity 10%: codes should have reasonable implementation and should not be too complicated.
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