Homework #2

- Out: Thursday January 29

- Due: Thursday February 12

HCI/CprE/ComS 575X: Computational Perception
Iowa State University
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Homework #2 (Part 1)
Basic Mathematical Morphology

(A) In this problem you are asked to replicate one of the results given in the "Mathematical Morphology" paper by Haralick and Shapiro (i.e., Chapter 5 in "Computer and Robot Vision", Addison-Wesley, 1993). Using the morphological operators provided by matlab write a short program that reads the image of the pendulum and separates it into its two basic components: disk and handle. Post your matlab code, your original image and your two resulting images on the wiki page. The original grayscale image will be provided along with the submission templates.
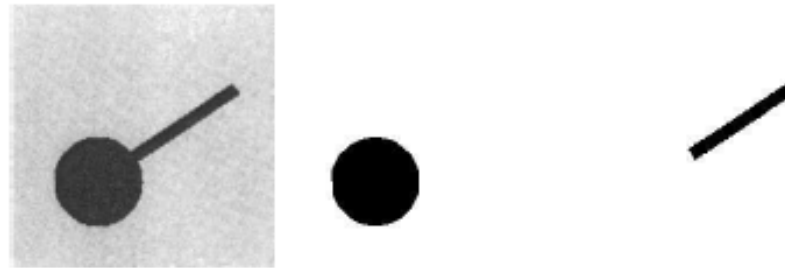

Figure 1: **Left:** original Image; **Center:** segmented disk; **Right:** segmented handle.

(B) Now do the same but this time use openCV to perform the segmentation. Post your C code, your original image and your two resulting images on the wiki page.

Homework #2 (Part 2)
Detecting and reading barcodes

- Step 1: read the following web page
  - http://www.howstuffworks.com/upc.htm

- Step 2: Download the five sample barcode images from the class web page.

Homework #2 (Part 2)
Detecting and reading barcodes

- Step 3: Write code that reads the barcode from the image and prints its 12 digits on the screen.

- You can do this in 2 ways:
  - Read the barcode by interpreting the vertical lines
  - Read the barcode by recognizing the human readable digits with your program.

Barcode Examples
(simple cases)

0 1 8 0 0 0 8 7 1 0 2 5

7 1 8 9 0 8 1 4 4 4 7 3

Barcode Examples
(you will get extra credit if your code can work with any one of these)

0074-660601

6 39382 00039 3

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NOVEMBER 26, 2004

What to Submit (for part 2)

- Post your original barcode images, your result images, and your code on the Wiki.

- Your code must work on at least two barcodes
  - (if the sample barcode images don't work for you then scan some barcodes and use them instead).

- You can use either matlab or OpenCV for part 2.

- Your grade will not depend on the method and/or platform that you choose.

Homework #2 (Part 3)
License Plate Numbers

- A) Write a program that finds the occurrence of the number '5' in an image of car license plate.

- B) Modify your program to find the occurrences of all numbers 0-9 in an image of a license plate. Letters can be skipped.

- Your code will be evaluated with images of the same type (i.e., Iowa license plates)

Sample License Plates
(posted on the class web page)

HCI 575X

679ER

12345

98765

54A94

F64A3

4G621

Don't Like the Sample Images?

- Use the following web page to create your own license plate images

    - http://www.acme.com/licensemaker/licensemaker.cgi

What to Submit (for part 3)

- Post your original images, your result images, and your code on the Wiki.

- Your code must work on at least five images

- You can use either matlab or OpenCV for part 3.

- Your grade will not depend on the method and/or platform that you choose.

That's it.

Good Luck!