

Assignment 2 —Image Edge Detection and Thresholding

Purpose

- Familiar with programming for image processing
- Understand the edge detection and thresholding algorithms

Data:

Take or download three images, (i) a building image; (ii) an indoor image; and (iii) an image with one object and relatively clean background.

Work to do:

1. Perform edge detections of the three images using Roberts, Sobel, Marr-Hildreth, and Canny edge detectors, respectively. Show and analyze your results.
2. Detect one or two prominent lines using Canny edge detector and Hough transform. Show and analyze your results by choosing two different subdivisions of the parameter space.
3. Segment the image into two regions using (i) global thresholding; (ii) Otsu's optimum thresholding; and (iii) variable thresholding based on local image properties. Show and analyze your results.

Suggested report format:

- Cover page, with title, course number, name, student ID, date, and abstract,
- Technical discussion. Present the techniques you used for each tasks.
- Results. Show the original images and the results you obtained from each task.
- Analysis. A discussion of your results, your expectation of each operation, did you obtain the results expected? why?
- Appendix. Program list for each task with necessary comments.

Requirements:

- The assignment is due on **November 8th 23:59pm local time**.
- Submit your report in PDF format to ghwang@ku.edu with the subject "**EECS 740 Assignment 2**"
- You can use any program language you are familiar with, although Matlab is preferred.
- You can use available functions for these tasks, but you have to write at least one function by yourself.

Available resources

- Chapter 10 of the textbook
- Matlab Image Processing Toolbox