CS 415 Machine Problem #3

1 Hough transform

The purpose of this MP is to give you a chance to get the basic ideas of Hough transform by implementing the algorithm for line detection. The due date of this assignment is 10/14/2020 (Wed). Please submit via Gradescope.

You can either use your own Canny edge detector from MP #2 or call any built-in edge detectors from MATLAB or Python packages.

In your implementation, you should play with different settings for the quantization of the parameter space, to see how different quantization levels affect the accuracy of detection.

You also need to come up with an idea of detecting those *significant* intersections in the parameter space, which is critical for line detection.

After obtaining the parameters of each line, you can call built-in line drawing functions in OpenCV to visualize them in the image.

Three testing images are shown here[1]. Be careful that all the images are 24-bit RGB images, although some of them look gray scale.

Calculating the Hough voting matrices using different quantization levels is mandatory. Detecting significant intersections and drawing the lines are optional but finishing them will give you 20 points bonus.
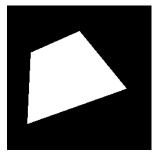

Figure 1: testing images.

2 What to turn in

Each individual student should turn in their own solution. What you need to turn in includes:
- your code in Python (recommended) or MATLAB;
- a short report.

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[1] You can download these images from our course website.