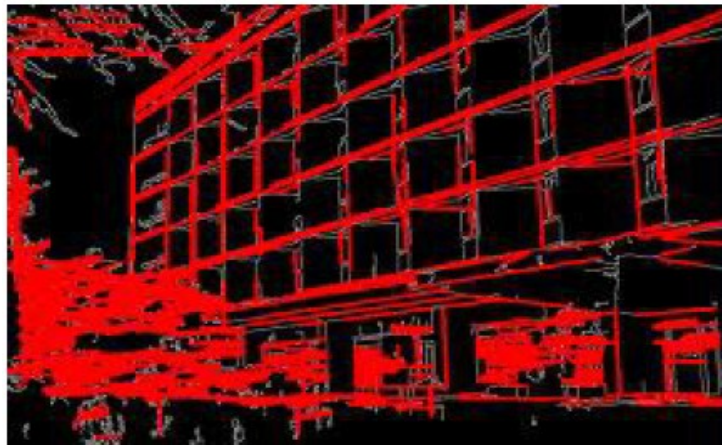


Homework #4

Line Detection

Please present a report with all your answers, explanations, and sample images or plots. Submit also a soft copy of the source code and binaries used to generate these results. Please note that copying of any results or source code will result in ZERO credit for the whole homework.



In this homework you will implement the Hough Transform algorithm for line detection in an image. The steps should be as follows:

1. Implement Hough Transform for line detection. Your algorithm should take as input at least a binary image and the resolution for both r and θ .
2. The algorithm should work in two modes: returning all lines with accumulator values above a certain threshold, or the local maxima in the accumulator array.
3. Implement a function that can plot lines produced from the Hough Transform algorithm on top of the image.

Requirements:

1. Run an edge detection algorithm (e.g. Canny Edge detection) on the images of this homework to produce a binary image with the detected edges.
2. Run your Hough Transform algorithm on the edge images with a fixed threshold and different resolutions and describe what the effect of too coarse or too fine bin sizes. Choose the resolutions that return the best results. Explain your choice.
3. With the best values of resolutions from above, compare using a fixed threshold to returning the local maxima in the accumulator array. Which is better? Why?