INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
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EE5113 – Computer Vision

Programming Assignment-2

Hough Transform

Objective: The objective of this assignment is to familiarize the feature extraction method - Hough Transform. The purpose of the technique is to find imperfect instances of objects within a certain class of shapes by a voting procedure. This voting procedure is carried out in a parameter space, from which object candidates are obtained as local maxima in a so-called accumulator space that is explicitly constructed by the algorithm for computing the Hough transform.

N.B: You can use inbuilt commands to detect the edges. But do not use inbuilt commands such as HoughLine/HoughCircles to detect the shape, instead write your own code from scratch.

1). Detection of Straight Lines

1)

a) Read the image 'image1.png'. Find and plot the edges of the image using 'Canny edge detector'.

b) Detect the lines using Hough method. Plot the Hough accumulator array image and intensity image with lines drawn on them. And also mention bin size and bin ranges.

c) Repeat the above procedure on 'image3.png' (image1.png with noise).

2)

a) Repeat the above procedure on 'image2.png' and 'image4.png' (image2.png with noise). This question is to ensure that your program can detect non vertical and non-horizontal lines.

2). Detection of Circles

1)

a) Read the image 'image5.png'. Find and plot the edges of the image using 'Canny edge detector'.

b) Detect lines and circles using Hough method. Plot the intensity image with lines and circles drawn on them. Also mention bin sizes and bin ranges.

2)

a) Read the clutter images 'image6.png' and image7.png' and detect the lines and circles.

b) Are you able to detect the shapes using the above program? If not, what are the changes you have made in programs?