Indian Institute of Information Technology Allahabad

IVP LAB ASSIGNMENT VI

IMPORTANT: For this assignment you can use basic linear algebra operations provided by numpy in Python. Implement the following edge detection algorithms.

You can use reference images from here. Your main function should take as input a grayscale image and the edge detection parameters. The output of your function should be a binary image with the results of edge detection (example).

1. First Order Derivative Filters:
    a. Sobel Filter: Use 3 X 3 kernel and approximate gradient in both directions
2. Second Derivative Operator:
    a. Marr-Hildreth Operator or Laplacian of Gaussian: Use 3 X 3 kernel of your choice
3. Canny's edge detection algorithm. Include the following steps:
    a. Noise reduction using Gaussian filter
    b. Gradient calculation along the horizontal and vertical axis
    c. Suppression of False Edges
    d. Hysteresis Thresholding
