

EECS101: HOMEWORK #4

Due: February 10, 2023

The purpose of this assignment is to apply an edge detection algorithm to several images and display the results. Three gray level images will be provided by your TA. For each image

- 1) Display the gray level image.
- 2) Generate an image that is proportional to the absolute value of $\frac{\partial E}{\partial x}$ using the Sobel operator on the input image. Multiply every pixel in this computed image by the same constant so that the maximum value is 255. Output and display this image.
- 3) Generate an image that is proportional to the absolute value of $\frac{\partial E}{\partial y}$ using the Sobel operator on the input image. Multiply every pixel in this computed image by the same constant so that the maximum value is 255. Output and display this image.
- 4) Generate an image that is proportional to the squared gradient magnitude of the input image using the Sobel operator. Multiply every pixel in this computed image by the same constant so that the maximum value is 255. Output and display this image.
- 5) Apply a suitable threshold to the squared gradient magnitude image to generate a binary image that isolates the edges. Output and display this image.

You should write programs corresponding to tasks 2) - 5) that generate 4 images for each of the 3 input images. Submit your code and your 12 images.