import cv2

import numpy as np

from matplotlib import pyplot as plt

image = cv2.imread('1.png', cv2.IMREAD\_GRAYSCALE)

gradient\_mask1 = np.array([[-1, -2, -1],

[ 0, 0, 0],

[ 1, 2, 1]])

gradient\_mask2 = np.array([[-1, 0, 1],

[-2, 0, 2],

[-1, 0, 1]])

grad1 = cv2.filter2D(image, -1, gradient\_mask1)

grad2 = cv2.filter2D(image, -1, gradient\_mask2)

gradient\_magnitude = cv2.addWeighted(grad1, 0.5, grad2, 0.5, 0)

sharpened = cv2.add(image, gradient\_magnitude)

plt.figure(figsize=(12, 4))

plt.subplot(1, 4, 1)

plt.title("Original")

plt.imshow(image, cmap='gray')

plt.subplot(1, 4, 2)

plt.title("Gradient Mask 1")

plt.imshow(grad1, cmap='gray')

plt.subplot(1, 4, 3)

plt.title("Gradient Mask 2")

plt.imshow(grad2, cmap='gray')

plt.subplot(1, 4, 4)

plt.title("Sharpened")

plt.imshow(sharpened, cmap='gray')

plt.tight\_layout()

plt.show()

