# -\*- coding: utf-8 -\*-

"""

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"""

import cv2 as cv

import numpy as np

import matplotlib.pyplot as plt

import math

def clip(img):

m = img.shape[0]

n = img.shape[1]

for i in range(m):

for j in range(n):

if img[i][j] > 255:

img[i][j] = 255

if img[i][j] < 0:

img[i][j] = 0

return img.astype(np.float32)

path = "C:/Users/Asus/imagelab/Image-Processing-and-Computer-Vision-Lab/Lab 2/Prewitt/input.jpg"

img = cv.imread(path)

img = cv.cvtColor(img,cv.COLOR\_BGR2GRAY)

plt.imshow(img,'gray')

plt.title("Input for scharr: ")

plt.show()

kernel\_v = np.array(([-3,0,3],[-10,0,10],[-3,0,3]),np.float32)

kernel\_h = np.array(([-3,-10,-3],[0,0,0],[3,10,3]),np.float32)

a = kernel\_h.shape[0] // 2

b = kernel\_h.shape[1] // 2

m = img.shape[0]

n = img.shape[1]

op\_v = np.zeros((m,n),np.float32)

op\_h = np.zeros((m,n),np.float32)

for i in range(m):

for j in range(n):

for x in range(-a,a+1):

for y in range(-b,b+1):

if i-x>=0 and i-x<m and j-y>=0 and j-y<n:

op\_v[i][j]+=kernel\_v[x+a][y+b]\*img[i-x][j-y]

else:

op\_v[i][j]+=0

plt.imshow(op\_v,'gray')

plt.title("Vertical raw output:")

plt.show()

op\_v = clip(op\_v)

plt.imshow(op\_v,'gray')

plt.title("Vertical clipped output:")

plt.show()

for i in range(m):

for j in range(n):

for x in range(-a,a+1):

for y in range(-b,b+1):

if i-x>=0 and i-x<m and j-y>=0 and j-y<n:

op\_h[i][j]+=kernel\_h[x+a][y+b]\*img[i-x][j-y]

else:

op\_v[i][j]+=0

plt.imshow(op\_h,'gray')

plt.title("Horizontal raw output:")

plt.show()

op\_h = clip(op\_h)

plt.imshow(op\_h,'gray')

plt.title("Horizontal clipped output:")

plt.show()

op\_v = op\_v+op\_h

op\_v = clip(op\_v)

plt.imshow(op\_v,'gray')

plt.title("Added clipped output:")

plt.show()

img = img+op\_v

img = clip(img)

plt.imshow(img,'gray')

plt.title("Enhanced output:")

plt.show()