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Tìm biên ảnh

import cv2

import numpy as np

import matplotlib.pyplot as plt

img = cv2.imread(r"C:/Users/nguye/OneDrive/Pictures/anh\_test.jpg")

img\_gray = cv2.cvtColor(img, cv2.COLOR\_BGR2GRAY)

img\_gau = cv2.GaussianBlur(img\_gray, (3,3), 0)

#Toán tử Sobel

grad\_x = cv2.Sobel(img\_gau, cv2.CV\_64F, 1, 0, ksize= 3)

grad\_y = cv2.Sobel(img\_gau, cv2.CV\_64F, 0, 1, ksize= 3)

abs\_grad\_x = cv2.convertScaleAbs(grad\_x)

abs\_grad\_y = cv2.convertScaleAbs(grad\_y)

grad = cv2.addWeighted(abs\_grad\_x, 0.5, abs\_grad\_y, 0.5, 0)

#Toán tử prewitty

kernelx = np.array([[1,1,1],[0,0,0],[-1,-1,-1]])

kernely = np.array([[-1,0,1],[-1,0,1],[-1,0,1]])

img\_prewittx = cv2.filter2D(img\_gau, -1, kernelx)

img\_prewitty = cv2.filter2D(img\_gau, -1, kernely)

prewitty = (img\_prewittx + img\_prewitty)

#Toán tử Roberts

kernelX = np.array([[0,0,0],[0,1,0],[0,0,-1]])

kernelY = np.array([[0,0,0],[0,0,-1],[0,1,0]])

img\_robertsx = cv2.filter2D(img\_gau, -1, kernelX)

img\_robertsy = cv2.filter2D(img\_gau, -1, kernelY)

roberts = cv2.addWeighted(img\_robertsx, 0.5, img\_robertsy, 0.5, 0)

#Phương pháp Laplace

img\_laplace = cv2.Laplacian(img\_gau, cv2.CV\_64F, ksize= 3)

abs\_lap = cv2.convertScaleAbs(img\_laplace)

#Phương pháp Canny

triangle\_thresh, \_ = cv2.threshold(img\_gau, 0, 255, cv2.THRESH\_TRIANGLE)

def get\_range(threshold, sigma=0.33):

return (1-sigma) \* threshold, (1+sigma) \* threshold

triangle\_thresh = get\_range(triangle\_thresh)

img\_canny = cv2.Canny(img\_gau, \*triangle\_thresh)

plt.figure(figsize=(10,10))

plt.subplot(3,3,1),plt.imshow(img, cmap = 'gray')

plt.title('Original'), plt.xticks([]), plt.yticks([])

plt.subplot(3,3,2),plt.imshow(grad, cmap = 'gray')

plt.title('Sobel'), plt.xticks([]), plt.yticks([])

plt.subplot(3,3,3),plt.imshow(prewitty,cmap = 'gray')

plt.title('prewitty'), plt.xticks([]), plt.yticks([])

plt.subplot(3,3,4),plt.imshow(roberts,cmap = 'gray')

plt.title('Roberts'), plt.xticks([]), plt.yticks([])

plt.subplot(3,3,5),plt.imshow(abs\_lap,cmap = 'gray')

plt.title('Laplace'), plt.xticks([]), plt.yticks([])

plt.subplot(3,3,6),plt.imshow(img\_canny,cmap = 'gray')

plt.title('Canny'), plt.xticks([]), plt.yticks([])

plt.show()

**Tìm Contour**

import cv2

import numpy as np

import matplotlib.pyplot as plt

import random as rng

img = cv2.imread(r"C:/Users/nguye/OneDrive/Pictures/anh\_test.jpg")

img\_gray = cv2.cvtColor(img, cv2.COLOR\_BGR2GRAY)

img\_gau = cv2.GaussianBlur(img\_gray, (5,5), 0)

img\_canny = cv2.Canny(img\_gau, 50, 100)

contours, \_ = cv2.findContours(img\_canny, cv2.RETR\_TREE, cv2.CHAIN\_APPROX\_SIMPLE)

img\_out = np.zeros((img\_canny.shape[0], img\_canny.shape[1], 3), dtype = np.uint8)

for i in range(len(contours)):

color = (rng.randint(0, 255), rng.randint(0, 255), rng.randint(0, 255))

cv2.drawContours(img\_out, contours, i, color, 2)

plt.figure(figsize=(10, 10))

plt.subplot(1, 2, 1)

plt.imshow(img)

plt.title("Ảnh gốc"),plt.xticks([]),plt.yticks([])

plt.subplot(1, 2, 2)

plt.imshow(img\_out)

plt.title("Contours"),plt.xticks([]),plt.yticks([])

plt.show()