OpenCV. РОБОТА із ЗОБРАЖЕННЯМИ

Файл: CV_Image_09_001

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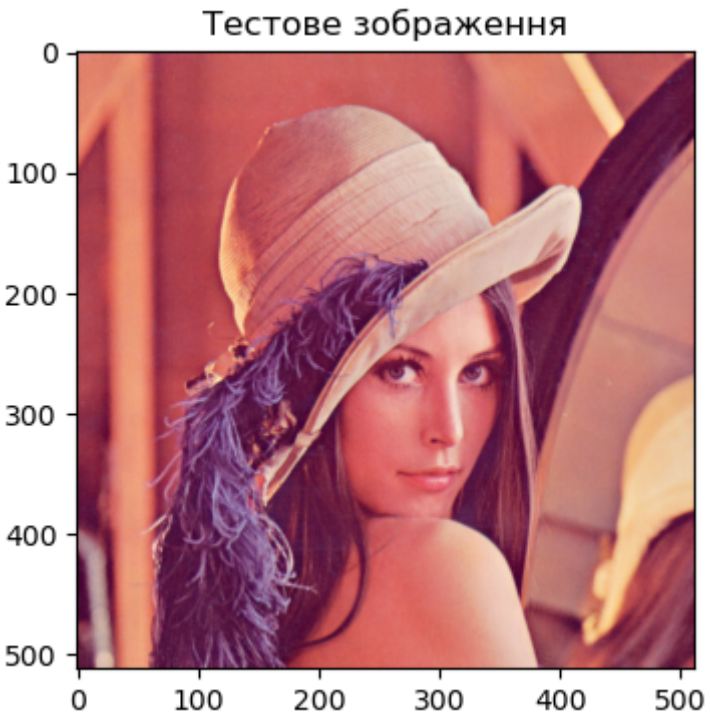
[FAST Algorithm for Corner Detection]

```
# ВСЯКИЕ РАЗНЫЕ ПАКЕТЫ
import cv2 as cv
import numpy as np
import matplotlib.pyplot as plt
import skimage.io as io
import time
```

ЗАГРУЗКА ФОТО

```
## %%script false
# Завантаження зображення
path = './IMAGES/'
filename = 'Lenna.png'
# filename = 'Face_1_300_X_400.jpg'
test_img_ = io.imread(path+filename)
#  Визначення стркутури та розміру зображення
print('---- TEST IMAGE  -----')
print('IMAGE SHAPE', test_img_.shape, 'IMAGE SIZE', test_img_.size)
irows_num = test_img_.shape[0]  # кількість рядків
iclms_num = test_img_.shape[1]  # кількість колонок
print('ROWS NUMBER', irows_num, 'CLMS NUMBER', iclms_num)
fig, ax = plt.subplots(figsize=(4, 4))
plt.imshow(test_img_)
plt.title("Тестове зображення")
plt.show()
```

```
---- TEST IMAGE  -----
IMAGE SHAPE (512, 512, 3) IMAGE SIZE 786432
ROWS NUMBER 512 CLMS NUMBER 512
```




```
test_img = cv.cvtColor(test_img_, cv.COLOR_BGR2RGB)
# Wait for a key press and close the window
while True:
    cv.imshow('Display window', test_img)
    if cv.waitKey(1) == ord('q'):
        break
cv.destroyAllWindows()
```

Рамка

```
# I am giving  big random numbers for x_min and y_min because if you initialize
them as zeros whatever coordinate you go minimum will be zero
x_min,y_min,x_max,y_max=36000,36000,0,0

def coordinat_chooser(event,x,y,flags,param):
    global go , x_min , y_min, x_max , y_max

    # when you click the right button, it will provide coordinates for variables
    if event==cv.EVENT_RBUTTONDOWN:

        # if current coordinate of x lower than the x_min it will be new x_min ,
same rules apply for y_min
        x_min=min(x,x_min)
        y_min=min(y,y_min)

         # if current coordinate of x higher than the x_max it will be new x_max ,
same rules apply for y_max
        x_max=max(x,x_max)
        y_max=max(y,y_max)
```

```
        # draw rectangle
        cv.rectangle(test_img,(x_min,y_min),(x_max,y_max),(0,255,0),1)


    """
        if you didn't like your rectangle (maybe if you made some misscliks),
reset the coordinates with the middle button of your mouse
        if you press the middle button of your mouse coordinates will reset and
you can give a new 2-point pair for your rectangle
    """
    if event==cv.EVENT_MBUTTONDOWN:
        print("reset coordinate  data")
        x_min,y_min,x_max,y_max=36000,36000,0,0
```

ОБИРАЄМО BOX

```
cv.namedWindow('coordinate_screen')
# Set mouse handler for the specified window, in this case, "coordinate_screen"
window
cv.setMouseCallback('coordinate_screen',coordinat_chooser)

while True:
    cv.imshow("coordinate_screen",test_img) # show only first frame

    k = cv.waitKey(5) & 0xFF # after drawing rectangle press ESC
    if k == 27:
        cv.destroyAllWindows()
        break

print (x_min,y_min,x_max,y_max)
```

```
57 38 391 308
```

З зображення беремо BOX

```
# take region of interest ( take inside of rectangle )
image_box=test_img[y_min:y_max,x_min:x_max]

# convert roi to grayscale, SIFT Algorithm works with grayscale images
image_box_gray=cv.cvtColor(image_box,cv.COLOR_BGR2GRAY)
#image_box_gray_ = cv.cvtColor(image_box_gray, cv.COLOR_BGR2RGB)

# Wait for a key press and close the window
while True:
    cv.imshow('Display window', image_box_gray)
    if cv.waitKey(1) == ord('q'):
        break
cv.destroyAllWindows()
```

```
# Initialize the FAST detector and BRIEF descriptor extractor
fast = cv.FastFeatureDetector_create(threshold=20)
brief = cv.xfeatures2d.BriefDescriptorExtractor_create()
```

```
# detect keypoints
keypoints_1 = fast.detect(image_box_gray, None)
# descriptors
keypoints_1, descriptors_1 = brief.compute(image_box_gray, keypoints_1)

# draw keypoints for visualizing
keypoints_image = cv.drawKeypoints(image_box_gray, keypoints_1, outImage=None,
color=(0, 255, 0))
# display keypoints
plt.imshow(keypoints_image,cmap="gray")
```

```
<matplotlib.image.AxesImage at 0x19637a45730>
```