Manara university
Engineering college

Faculty of Informatics engineering

Computer vision

2025 – 2026

Lab session 2: operations on the image

Tasks:

1. Read images P1 and P2, P3 and P4 in the gray scale and store them as img1, img2. Img3, and img4 respectively.
2. Get the rows and columns of img1 using img1.shape and store them as (r, c).
3. Resize img3, img4 and img5 into [500.500] using cv2.resize(img ,(new size)).
4. Initialize two zeros arrays like the shape of P1 or P2 and name them as (img_add) and (img_sub) using np.zeros((size), datatype).
5. Convert any non-zero pixel in both images (P1 and P2) into 255, and keep the zero pixels.
6. Add (P1 and P2) and check that the sum result is not bigger than 255 (if the sum exceeded 255 make it 255 again), and store the sum result in (img_add) array.
7. Subtract (P2 from P1) and check that the subtraction result is not smaller than 0 (if the subtraction result is less than 0 make it 0), and store the sum result in (img_sub) array.
8. Display (img1, Img2, img_add, img_sub).
9. Display the difference of P3 and P4 using (plt.show) method.
10. Crop the center of the image by a [25, 25] window and display the result.

Needed syntaxes:

 # if condition

```
if condition:
        # some of statements
```

 # for loop generation (repeats 500 times)

```
for i in range(500):
        # some of statements
```

 # printing of the value of the pixel in 5^{th} row and 10^{th} column of the (Img) array

```
print( Img[5, 10] )
```

code:

```
import cv2 as cv
import numpy as np
import matplotlib.pyplot as plt


path = r' \\'
img1 = cv.imread(path+'P1.png', cv.IMREAD_GRAYSCALE)
img2 = cv.imread(path+'P2.png', cv.IMREAD_GRAYSCALE)
img3 = cv.imread(path+'P3.jpg',0)
img4 = cv.imread(path+'P4.jpg', 0)
img5 = cv.imread(path+'P5.jpg', 0)

img3_r = cv.resize(img3, (500, 500))
img4_r = cv.resize(img4, (500, 500))
img5_r = cv.resize(img5, (500, 500))



r, c = img1.shape[:2]
img_add = np.zeros([r,c])
img_sub = np.zeros([r,c])
for i in range(r):
    for j in range(c):
        if img1[i, j] > 0:
            img1[i, j] = 255
        if img2[i, j] > 0:
            img2[i, j] = 255

        summ = img1[i, j] + img2[i, j]
        subb = img1[i, j] - img2[i, j]
```

```
        if summ > 255:
            summ = 255
        img_add[i, j] = summ
        if subb < 0:
            subb = 0
        img_sub[i, j] = subb
sub2 = img4_r - img3_r
sub3 = img3_r - img5_r
'''
cv.imshow('P1', img1)
cv.waitKey(0)
cv.imshow('P2', img2)
cv.waitKey(0)
cv.imshow('Add', img_add)
cv.waitKey(0)
cv.imshow('Subtract1', img_sub)
'''
#plt.imshow(img3_r, cmap='gray')
plt.imshow(sub2, cmap='gray')
#plt.imshow(img3_r, cmap='gray')
#cv.imshow('Subtract3', sub3)
plt.show()
```