Pengolahan Citra

Pekan 4. Filtering LPH dan HPF in domain spatial

Dosen Pengampu

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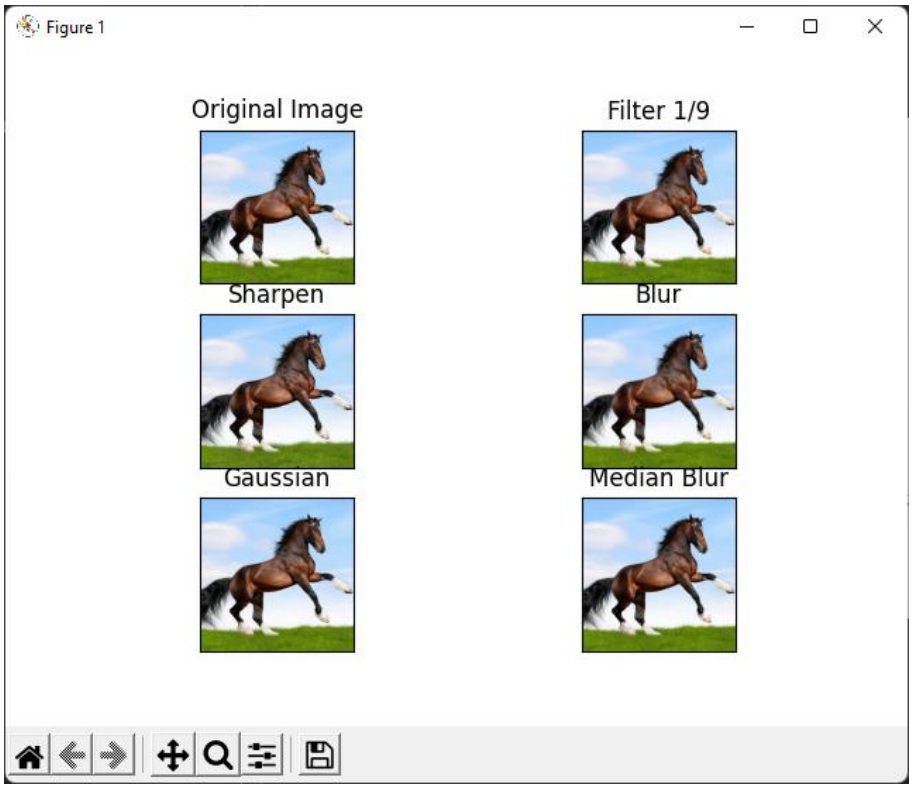
Source Code :

```
def convolution2D():
    img1 = cv2.imread('gambar/kuda.jpg')
    img1 = cv2.cvtColor(img1, cv2.COLOR_BGR2RGB)
    kernel = np.ones((3, 3), np.float32) / 9
    #print (kernel)
    img2 = cv2.filter2D(img1, -1, kernel)

    kernel = np.array([[0,  -1, 0],
                       [-1, 5, -1],
                       [0, -1, 0]])
    img3 = cv2.filter2D(img1, -1, kernel)

    img4 = cv2.blur(img1, (5, 5))
    img5 = cv2.GaussianBlur(img1, (3, 3), 0)
    img6 = cv2.medianBlur(img1, 3)

    titles = ['Original Image', 'Filter 1/9',
              'Sharpen', 'Blur', 'Gaussian', 'Median Blur']
    images = [img1, img2, img3, img4, img5, img6]
    for i in range(6):
        plt.subplot(3, 2, i+1), plt.imshow(images[i], 'gray', vmin=0,
vmax=255)
        plt.title(titles[i])
        plt.xticks([]), plt.yticks([])
    plt.show()
    return
convolution2D()
```



Source Code :

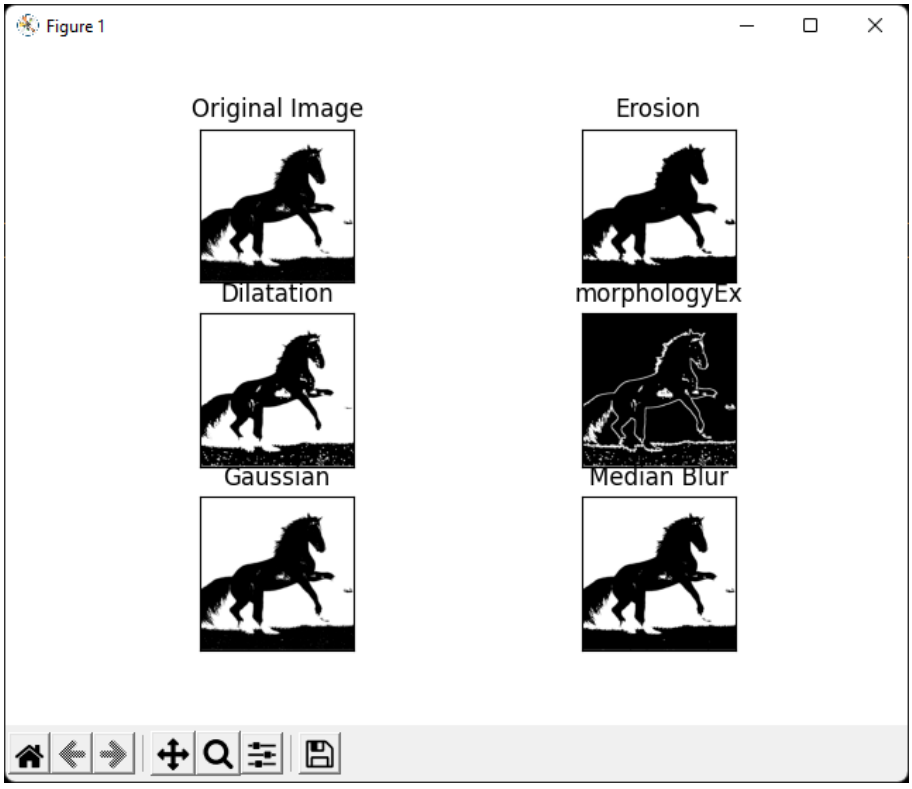
```
def dilatation():
    img1 = cv2.imread('gambar/kuda.jpg')

    # convert to black and white
    img1 = cv2.cvtColor(img1, cv2.COLOR_BGR2GRAY)
    r, img1 = cv2.threshold(img1, 150, 255, cv2.THRESH_BINARY)
    # create kernel
    kernel = np.ones((5, 5), np.uint8)
    img2 = cv2.erode(img1, kernel)
    img3 = cv2.dilate(img1, kernel)
    img4 = cv2.morphologyEx(img1, cv2.MORPH_GRADIENT, kernel)

    img5 = cv2.GaussianBlur(img1, (3, 3), 0)
    img6 = cv2.medianBlur(img1, 3)

    titles = ['Original Image', 'Erosion', 'Dilatation',
              'morphologyEx', 'Gaussian', 'Median Blur']
    images = [img1, img2, img3, img4, img5, img6]
    for i in range(6):
        plt.subplot(3, 2, i+1), plt.imshow(images[i], 'gray', vmin=0,
vmax=255)
        plt.title(titles[i])
        plt.xticks([]), plt.yticks([])
    plt.show()
    return

dilatation()
```



Source Code :

```
def filtering():
    img1 = cv2.imread('gambar/kuda.jpg')
    kernel = np.array([[1, 1, 1, 1, 1],
                       [1, 1, 1, 1, 1],
                        [1, 1, 1, 1, 1],
                        [1, 1, 1, 1, 1],
                        [1, 1, 1, 1, 1]])

    kernel = kernel/25
    img2 = cv2.filter2D(img1, -1, kernel)
    kernel = np.array([[0.0, -1.0, 0.0],
                       [-1.0, 4.0, -1.0],
                        [0.0, -1.0, 0.0]])

    kernel = kernel/(np.sum(kernel) if np.sum(kernel) != 0 else 1)
    img3 = cv2.filter2D(img1, -1, kernel)
    kernel = np.array([[0.0, -1.0, 0.0],
                       [-1.0, 5.0, -1.0],
                        [0.0, -1.0, 0.0]])

    kernel = kernel/(np.sum(kernel) if np.sum(kernel) != 0 else 1)
    img4 = cv2.filter2D(img1, -1, kernel)

    # img4= cv2.morphologyEx(img1, cv2.MORPH_GRADIENT, kernel)
    # img5= cv2.GaussianBlur(img1, (3,3), 0)
    # img6= cv2.medianBlur(img1, 3)

    kernel = np.array([[-1.0, -1.0, ],
                       [2.0, 2.0],
                        [-1.0, -1.0]])

    kernel = kernel/(np.sum(kernel) if np.sum(kernel) != 0 else 1)
    img5 = cv2.filter2D(img1, -1, kernel)
    titles = ['original image', 'low pass', 'high pass',
              'high pass', 'cusom kernel', 'normal']
    images = [img1, img2, img3, img4, img5, img1]

    for i in range(6):
        plt.subplot(
            3, 2, i+1), plt.imshow(images[i], 'gray', vmin=-0, vmax=255)
        plt.title(titles[i])
        plt.xticks([]), plt.yticks([])
    plt.show()

    return
```

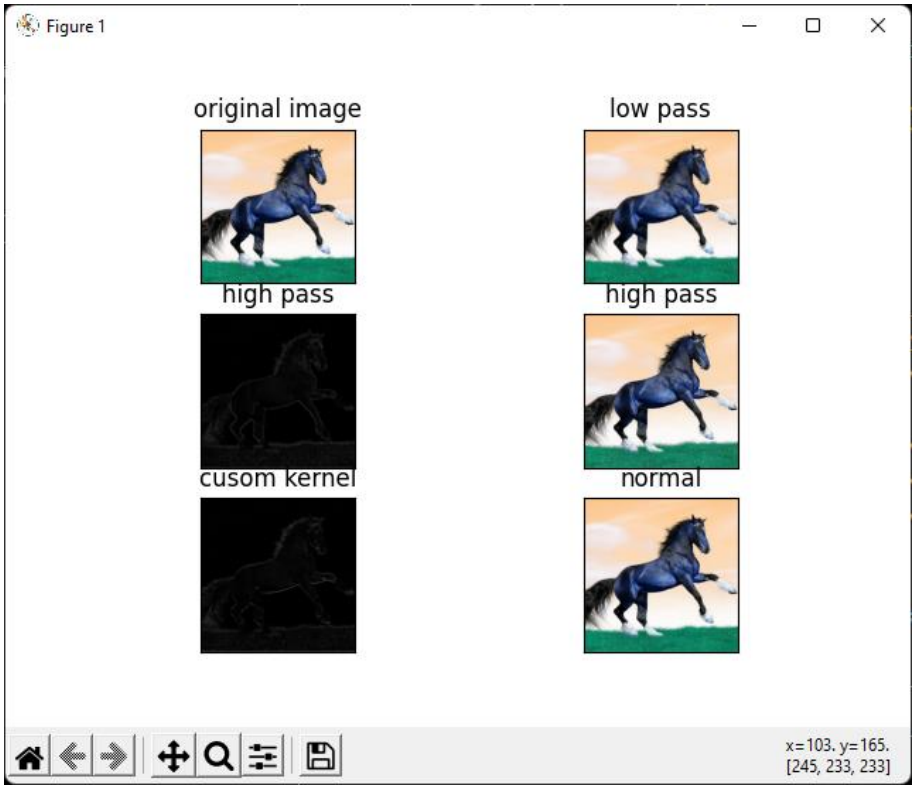


Figure 1
original image
low pass
high pass
high pass
cusom kernel
normal
x=103. y=165.
[245, 233, 233]