Datamining assignment05

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Name : Do-Hyun Kim

Student ID : 2018120193

github :   https://github.com/ppooiiuuyh/datamining_assignments/tree/master/assignment05

==
    import modules
    ==

```
In [1]: import matplotlib.pyplot as plt
        import numpy as np
        from scipy import signal, ndimage
        from skimage import io, color


        ==========================================================================
        define variables and maks
        ==========================================================================

In [2]: file_image        = 'cau.jpg'

        im_color          = io.imread(file_image)
        im_gray           = color.rgb2gray(im_color)

        Derivative_mask_x = np.array([[-1, 0, 1], [-1, 0, 1], [-1, 0, 1]])
        Derivative_mask_y = np.array([[1, 1, 1], [0, 0, 0], [-1, -1, -1]])
        Smooth_kernel = np.array([[.11, .11, .11], [.11, .11, .11], [.11, .11, .11]])
        MySharpening_kernel = np.array([[0, -1, 0], [-1, 5, -1], [0, -1, 0]])
        my_Sobel_edge = np.array([[-1, 0, 1], [-2, 0, 2], [-1, 0, 1]])


        ==========================================================================
        cal convolution
        ==========================================================================

In [3]: im_conv_Smooth        = signal.convolve2d(im_gray, Smooth_kernel, boundary='symm', mode=
        gx = ndimage.convolve(im_gray, Derivative_mask_x)
        gy = ndimage.convolve(im_gray, Derivative_mask_y)
        abs = np.hypot(gx, gy)
        dir = gy/gx
        my = ndimage.convolve(im_gray, my_Sobel_edge)
```

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```
C:\Users\ppooi\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: RuntimeWarning: divide by ze
  """
C:\Users\ppooi\Anaconda3\lib\site-packages\ipykernel_launcher.py:5: RuntimeWarning: invalid valu
  """


    ============================================================================
    plot result
    ============================================================================

In [4]: p1 = plt.subplot(3,3,1)
        p1.set_title('color image')
        plt.imshow(im_color)
        plt.axis('off')

        p2 = plt.subplot(3,3,2)
        p2.set_title('gray image')
        plt.imshow(im_gray, cmap='gray')
        plt.axis('off')

        p3 = plt.subplot(3,3,3)
        p3.set_title(' grad x')
        plt.imshow(gx , cmap='gray')
        plt.axis('off')

        p4 = plt.subplot(3,3,4)
        p4.set_title('grad y')
        plt.imshow(gy, cmap='gray')
        plt.axis('off')

        p4 = plt.subplot(3,3,5)
        p4.set_title('absolution')
        plt.imshow(abs, cmap='gray')
        plt.axis('off')

        p4 = plt.subplot(3,3,6)
        p4.set_title('direction')
        plt.imshow(dir, cmap='gray')
        plt.axis('off')


        p4 = plt.subplot(3,3,7)
        p4.set_title('smooth')
        plt.imshow(im_conv_Smooth, cmap='gray')
        plt.axis('off')

        p4 = plt.subplot(3,3,8)
        p4.set_title('my sobel edge mask')
```

```
plt.imshow(my, cmap='gray')
plt.axis('off')
plt.show()
```


color image   gray image   grad x

grad y   absolution   direction

smooth   my sobel edge mask