

Computer vision homework 6

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Original Lena image

1. Downsampling to 64*64

```
image = Image.open('lena.bmp')
binary = image.copy()
binary_resample = Image.new('L', (64, 64), color = 0)

(h, w) = image.size

for i in range(0, h):
    for j in range(0, w):
        if image.getpixel((i, j)) > 128:
            binary.putpixel((i, j), 255)
        else:
            binary.putpixel((i, j), 0)

(h_resample, w_resample) = binary_resample.size

test = open('test.txt', 'w')

for j in range(h_resample):
    for i in range(w_resample):
        binary_resample.putpixel((i, j), binary.getpixel((i*8, j*8)))
        binary_resample_list[i+2][j+2] = binary.getpixel((i*8, j*8))
        if binary_resample_list[i+2][j+2] == 255:
            test.write('#')
        else:
            test.write(' ')
    test.write('\n')
test.close
```

Source code of downsampling


```

binary_resample_list = [[0 for i in range(68)] for j in range(68)]
result = [[' ' for i in range(64)] for j in range(64)]

def h_func(b , c , d , e):
    #print b , c , d , e
    b_pix = binary_resample_list[b[0]+2][b[1]+2]
    c_pix = binary_resample_list[c[0]+2][c[1]+2]
    d_pix = binary_resample_list[d[0]+2][d[1]+2]
    e_pix = binary_resample_list[e[0]+2][e[1]+2]
    if b_pix == c_pix and (d_pix != b_pix or e_pix != b_pix):
        return 'q'
    elif b_pix == c_pix and (d_pix == b_pix and e_pix == b_pix):
        return 'r'
    else:
        return 's'

```

```

for i in range(h_resample):
    for j in range(w_resample):
        if binary_resample_list[i+2][j+2] == 255:
            a = [[i , j] , [i , j+1] , [i-1 , j+1] , [i-1 , j]]
            check = ['a']*4
            check[0] = h_func(a[0] , a[1] , a[2] , a[3])
            a = [[i , j] , [i-1 , j] , [i-1 , j-1] , [i , j-1]]
            check[1] = h_func(a[0] , a[1] , a[2] , a[3])
            a = [[i , j] , [i , j-1] , [i+1 , j-1] , [i+1 , j]]
            check[2] = h_func(a[0] , a[1] , a[2] , a[3])
            a = [[i , j] , [i+1 , j] , [i+1 , j+1] , [i , j+1]]
            check[3] = h_func(a[0] , a[1] , a[2] , a[3])
            counter_r = 0
            counter_q = 0
            for k in range(4):
                if check[k] == 'r':
                    counter_r += 1
                elif check[k] == 'q':
                    counter_q += 1
            if counter_r == 4:
                result[i][j] = '5'
            else:
                result[i][j] = str(counter_q)

result_file = open('result.txt' , 'w')
for j in range(w_resample):
    for i in range(h_resample):
        result_file.write(result[i][j])
        result_file.write('\n')

result_file.close

```

Source code of yokoi

11111111	121	111111122322221	111111111111	0
15555551	121	15555511 2 11 1	115555555511	
15555551	1	2221555112 2111222	155555555551	0
15555551	1 2	155112 1 11511	1555555555511	0
15555551	1	2112 1 121 0	1555555555511	
15555551	1	21 1 1	1155555555551	
15555551	1 1	121111 11 0	1555555555511	
15111551	1 12	125551111	1155555555551	
111 1551	0 0	155555511	15555555555511	
11 1551		2115555511	1551115555511	
21 1551		2 1555555111	1551 1155511	
1 1551		2 15555555511	1551 115551	1
1551		112115555555551	1551 15511	12
1551		1511155555555511	1151 1111	111
1551	1	2221 1555555555511	151 11	1151
1551	2	12 1 11555555555511	151 11111	1551
1551	2	115555555555551	151 115551	11551
1551	2	115555555555555111511155511	11511155511	115551
1551	12	1155555555555555555555551	155551	155551
1551	11	0 221555555555555555555555112	1155551	1155551
1551	111	22 155555555555555555555551 1	1555551	1555551
1551	1511	1 125112111112111555555555111	11555551	11555551
1551	1112	1 121 1 11 1 1555555111 0	15555551	15555551
1551	12 2	132 2 115555111 0	11555551	15555551
1551	222 0	322 115555111 121	15555551	15555551
1551	12 0	1 155551 131	125555551	
1551	2 0	11555511 1	15555551	
1551	2 0	115555551 0	1 15555551	
1551	2	1155555551	2115555551	
1551	1 0	11555555551	1555555551	
1551		11511115555521	1 11555555551	
1551	1 0	11111 1155511	2 15555555551	
1551	131	111 15111	2 15555555551	
1551	121	1121 1 111 1	2 115555555112	
1551	11	111 1 221 11 1	2 15555555551 2	
1551	12 0	1 21 121 11 1111	2 1555555555112	
1551	1	12 22 151111111551	2 1155555555551	
1551	1	2 1555551115511	1 1555555555551	
1551	2	0 0 22 12555551 15551	1 15555555555551	
1551	1	1 1555511 11511	2 115555555555551	
1551	0 0	21 155551 1 151	2 155555555555551	
1551		2 15555112 151	2 155555555555551	
1551	1	1 1 1255555511111	2 155555555555551	
1551	2	22 11511111212	2115555555555551	
1551	0	1 12 111 2 1	15555555111555551	
1551	0	0 0 0 111 121	155555551 1555551	
1551		0 11111111	155555551 1555551	
1551	0	115551	155555551 1555511	
1551		15551	211111111 155511	
11521	1	12 0 1155511	2 11 115511	
12 151 0	1	1 15555111	2111 15511	
22 1511		1 1555555111	155111 1511	
2 151		1 1555555551	155551 1151	
2 1521	0	0 115555555511	155511 1511	
2 151		121 11555555555511	15551 12151	
2 1511		0 155555555555551	155511 1551	
21 1511		11 155555555555551	115551 1511	
11 151	0	11555555555555511	111111151	
11 151		15555555555555551	111511	
11 151		11555555555555551	211	
11 151		115555555555555511	1	
11 151		0 15555555555555551		
11 111	0	1211111111111111111		

Result of yokoi