Computer Vision I \_2018

Homework assignment #3

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#使用python

#import套件

import numpy as np

import cv2

%matplotlib inline

import matplotlib.pyplot as plt

#用灰階讀檔

original = cv2.imread("lena.bmp", 0)

#用來count original裡面的灰階值的，用來畫histogram，nj的意思

count = np.zeros(256, np.int)

#填好count

for i in range (512):

for j in range (512):

count[original[i,j]] += 1

#histogram equalization

#先new一個空numpy array來接收equalization後的圖，cv2的image可以直接接收numpy array

#算一下equlized後的s陣列，還有總pixels數numberofpixels

equalized\_histogram = np.zeros([512,512], int)

#計算s用相關參數

rows, columns = original.shape

numberofpixels = rows \* columns

s = np.zeros(256)

summationnow = 0

denominator = 255 / float(numberofpixels)

#計算s

for i in range (256):

summationnow += count[i]

s[i] = summationnow \* denominator

#把s轉進二階矩陣以便輸出equalized後之lena

for i in range (512):

for j in range (512):

equalized\_histogram[i, j] = int(round(s[original[i,j]]))

#儲存equalized\_lena.jpg

cv2.imwrite("equalized\_lena.jpg", equalized\_histogram)

#作equalized\_histogram的圖

x = np.linspace(0,255,256, endpoint = True, dtype=np.int)

ax = plt.figure(figsize=(8,4))

ax.set\_facecolor((1, 0.8, 0.4))

plt.axes(facecolor='k')

plt.hist(equalized\_histogram.flatten(), bins = x, density=False, color='w')

plt.xlabel("gray level value")

plt.ylabel("count")

plt.title("equalized\_histogram")

plt.xlim(0, 255)

#plt.ylim(0, max(count))

#儲存equalized\_histogram的圖

ax.savefig("equalized\_histogram.jpg",facecolor=ax.get\_facecolor(), edgecolor='none')