Read, Write and Display an Image in Open CV

21 September 2020 15:17

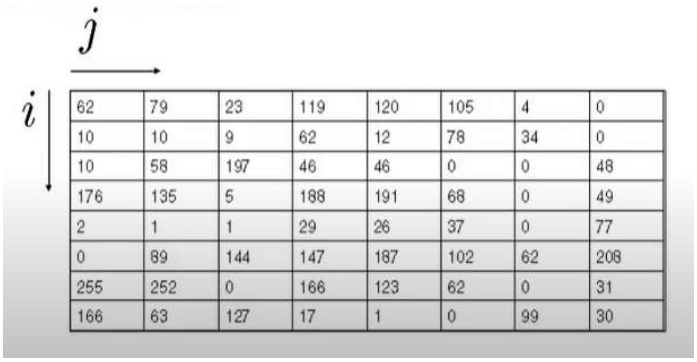
Introduction:

Open CV is an open-source Computer Vision, Image Processing and Machine Learning library.
Computer Vision is basically making the computers see and understand things just like humans.

Basic things about Open CV:

1. It was Developed by Intel.
2. Available on Mac, Windows and Linux.
3. It is now an Open Source and Free library.

So basically a computer sees the picture in a matrix form(digital images are 2D Arrays of P-I-X-E-L-S):



62	79	23	119	120	105	4	0
10	10	9	62	12	78	34	0
10	58	197	46	46	0	0	48
176	135	5	188	191	68	0	49
2	1	1	29	26	37	0	77
0	89	144	147	187	102	62	208
255	252	0	166	123	62	0	31
166	63	127	17	1	0	99	30

There are 3 channels in colored images: RED, GREEN and BLUE. However, in the case of greyscale images, it has only one channel.

To Install Open CV:

>>> pip install opencv-python

To Read an Image:

>>> img = cv2.imread('lena.jpg', -1)

cv2.imread() Second argument is a flag which specifies the way image should be read.

flag	integer value	description
cv2.IMREAD_COLOR	1	Loads a color image.
cv2.IMREAD_GRAYSCALE	0	Loads image in grayscale mode
cv2.IMREAD_UNCHANGED	-1	Loads image as such including alpha channel

#Even if you gave the wrong path, no exception would have come till now
If the file doesn't exist, **print(img)** will give **None** as output
Else, it will output a matrix (2D Array representing the pixels) as output

To Display an Image(after reading):

>>> cv2.imshow('image',img)

1st Argument=Name of Window in which the image will get displayed.
2nd Argument=Variable in which image was read

#After using this line, the image will pop up for a millisecond and then disappear.
#To stop the image, we need to use **cv2.waitKey()** function.

>>> cv2.waitKey(5000)	The Image will wait for 5000 milliseconds==5 seconds
>>> cv2.destroyWindow()	This is used to destroy a particular Window
>>> cv2.destroyAllWindows()	This is used to destroy all Windows

#However, if one uses **cv2.waitKey(0)**, it will wait for infinite time and wait for us to manually close the window!
#Also, the cv2.waitKey() outputs an integer which is the ASCII value of the key that is pressed on the keyboard

To Write an Image in a file(Saving an image after reading and performing operations):

>>> cv2.imwrite('writingname.png',img)

Overall, the code looks like this:

```
import cv2                              //Importing the Library

img = cv2.imread("Me.jpg" , 0)          //Reading the image in Greyscale Mode
cv2.imshow('First Image',img)           //Displaying the Image
k = cv2.waitKey(0)                      //Using Wait key to stop the image from disappearing

if k == 27:     //If the key pressed is Escape Key
    print("Hello I ran!")
elif k == ord('s'):                     //If the key pressed is 's'
    cv2.imwrite("Me_copy.png",img)      //Make a file Me_copy.png and write the output there
    cv2.destroyAllWindows()             //Destroy all Windows
```