**OpenCV**

To create an image we will take nd-array then we will colour each boxes in that array so that an image can be formed.

Primarily there ate two type of colours 1. Black – **0** 2. White-**1**

In reality each number of boxes in the nd-array are pixels.

VGA = 640 x 480 it means 640 width and 480 height

2 levels of colour is black-0, white-1

6 levels of colour

Now we are using 28= 256 levels i.e. 256 colours

For adding different colour we are using Red, Green, Blue. In short i.e. RGB

Here we have to install the module opencv.

Then we have to import by **import cv2.**

**Representation of image:**

🡪As we know we can represent an image by numpy nd array. for coloure image it has 3 parameter (Length, Width, 3(Red,Green,Blue)).

🡪For black and white image there is only two parameter (Length , width).

We can get the array form by **imread()** function in cv2 which takes two parameters the image address and 0-for black and white image and 1 for coloured image.

Ex:

import cv2

img1 = cv2.imread('C:\\Users\\Lenovo\\Desktop\\My Notes\\Python\\Open CV\\IMG\_20190903\_112911.jpg',0)

img2 = cv2.imread('C:\\Users\\Lenovo\\Desktop\\My Notes\\Python\\Open CV\\IMG\_20190903\_112911.jpg',1)

print(img1.shape)

print(img2.shape)

O/P:

(1280, 2560)

(1280, 2560, 3)

**Displaying image:**

We can display an image by **imshow()** in cv2. It takes two parameter one is name another is previously read image variable.

Here the image will shown on a window, we can end the window by two methods

**waitKey**(0) – it will end the window when we will press any key. We can give also specific time in miliseconds.

**destroyAllWindows() --**  It will simply destroy the window.

Ex: import cv2

img1 = cv2.imread('C:\\Users\\Lenovo\\Desktop\\My Notes\\Python\\Open CV\\IMG\_20190903\_112911.jpg',0)

cv2.imshow("Himansu",image\_scaled)

cv2.waitKey(2000)

cv2.destroyAllWindows()

**Resizing the image:**

We can resize an image by **resize().** It takes two parameters the image variable and the size.

Ex:

import cv2

img1 = cv2.imread('C:\\Users\\Lenovo\\Desktop\\My Notes\\Python\\Open CV\\IMG\_20190903\_112911.jpg',0)

resized = cv2.resize(img1,(700,500))

#It will half the size of image

#resized = cv2.resize(img1, (int(img1.shape[0]/2),int(img1.shape[1]/2)))

cv2.imshow("Himansu", resized)

cv2.waitKey(2000)

cv2.destroyAllWindows()

**Playing video:**

First we have to read the video by **VideoCapture()**

Then we have to read the images from the video and we have to play these one by one by a loop.

We can read image by **VideoCaptureVariable.read()**

Ex:

import cv2

cap = cv2.VideoCapture("C:\\Users\\Lenovo\\Videos\\chkusonu.mp4")

while True:

    success, img = cap.read()

    cv2.imshow("Video",img)

    if cv2.waitKey(1) & 0xFF == ord('q'): # we can stop video by typing q.

        break

* We can web cam or laptop camera by giving 0 in video read function.

Ex: cap = cv2.VideoCapture(0)

**Different functionalities of image:**

1. **Grey Image**

To convert an image to grey image we have to do following work.

img = cv2.imread("C:\\Users\\Lenovo\\Pictures\\Mychannel\\thumblin.jpeg")

imgGrey = cv2.cvtColor(img,cv2.COLOR\_BGR2GRAY)

cv2.imshow("Grey image",imgGrey)

1. **Blur image:**

img = cv2.imread("C:\\Users\\Lenovo\\Pictures\\Mychannel\\thumblin.jp")

#we can take only odd numbers inside parenthesis it tells the degree of blurness

imgblur = cv2.GaussianBlur(img,(7,7),0)

cv2.imshow("Grey image",imgblur)

1. **Canny image:**

This image only shows the edges of real image.

img = cv2.imread("C:\\Users\\Lenovo\\Pictures\\Mychannel\\thumblin.jpeg")

imgCanny = cv2.Canny(img,150,200)

cv2.imshow("Grey image",imgCanny)

We can increase and decrease the width of the edge by dialation and eroded.

Ex:

import cv2

import numpy as np

kernel = np.ones((5,5),np.uint8)

img = cv2.imread("C:\\Users\\Lenovo\\Pictures\\Mychannel\\thumblin.jpeg")

imgCanny = cv2.Canny(img,150,200)

imgDialation = cv2.dilate(imgCanny,kernel,iterations=3)

imgEroded = cv2.erode(imgDialation,kernel,iterations=1)

cv2.imshow("Canny image",imgCanny)

cv2.imshow("Dialated image",imgDialation)

cv2.imshow("Eroded image",imgEroded)

cv2.waitKey(0)

cv2.destroyAllWindows()

* We can crop an image by not taking the help of opencv. The images are nothing but the 2-dimentional matrix we can crop them by taking the matrix within a specific position.

import cv2

img = cv2.imread("C:\\Users\\Lenovo\\Pictures\\Mychannel\\thumblin.jpeg")

croppedimg = img[0:200,200:500]

cv2.imshow("Croped image",croppedimg)

cv2.waitKey(0)

cv2.destroyAllWindows()