Lesson 6 Image Basic Operation

1.Acquire and Modify the Pixel of the Image

The value of the pixel can be acquired through the coordinate of row and column. For BGR image, an array consisting of blue, green and red values will be returned. For grayscale image, the corresponding intensity will be returned. And the pixel can be modified in this way.

1) **img[x,y]**: Acquire the value of some pixel and return its BGR value.

2) **img[x,y,index]**: Acquire the value of a color channel. The order of the color channel is BGR.

3) **img[x,y]=[B,G,R]**: Modify the color channel value of this pixel.

```
img=cv2.imread("test.jpg")
px=img[100,100]
blue=img[100,100,0]
img[100,100]=[255,255,255]
```

2.Acquire the Image Property

1) **shape**: If it is a color picture, acquire the shape of the image and return an array containing the number of row, column and channel. If it is binary image or grayscale image, only the number of row and column will be returned. Through judging whether the returned value contains the number of channel, we can know that it is a grayscale picture or color picture.

2) **size**: Return the pixel number of the image. The format is "**row x column x channel**". The number of channel of the grayscale picture is 1.

3) **dtype**: Return the data type of the picture

```
print("shape=",img.shape)#"(1600,1200,3)"
print("size=",img.size)#"5760000"
print("dtype=",img.dtype)#"uint8"
```

3. Splitting and Merging of Image Channel

3.1Splitting of Image Channel

split: Input the image to be split and return the picture with three individual color channels.

```
img=cv2.imread("test.jpg")
B,G,R=cv2.split(img)
cv2.imshow("blue",B)
cv2.imshow("green",G)
cv2.imshow("red",R)
```

3.2 Merging of Image Channel

merge: Merge three individual channels, including B, G and R into BGR image with three channel.

```
img=cv2.imread("test.jpg")
B,G,R=cv2.split(img)
img=cv2.merge((B,G,R))
```

4. Color Space Conversion

There more than 150 ways to convert colors in OpenCV. And BGR is commonly converted into GRAY and HSV. The function format is **cvtColor(img,flag).**

1) **img**: The image converted the color space

2) **flag**: The converted type. For example, **cv2.COLOR_BGR2HSV** indicates that convert BGR into HSV.

```
img=cv2.imread("test.jpg")
img=cv2.cvtColor(img,cv2.COLOR_BGR2HSV)
```