

# COLOR DETECTION USING OPENCV

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## ABSTRACT

**Colour detection is the process of detecting the name of any color. Well, for humans this is an extremely easy task but for computers, it is not straightforward. Human eyes and brains work together to translate light into color. Light receptors that are present in our eyes transmit the signal to the brain. Our brain then recognizes the color. Since childhood, we have mapped certain lights with their color names. We will be using the somewhat same strategy to detect color names. Color detection using opencv has many advantages like, it allows the detection of a specific color in a livestream video content. In this opencv color detection system there are four major modules, activated webcam, scan object, match frame parts and system results. Users can open webcam by clicking the webcam button.**

## 1.Introduction

### 1.1Color Detection

we are going to build an application through which you can automatically get the name of the color by clicking on them. So for this, we will have a data file that contains the color name and its values. Then we will calculate the distance from each color and find the shortest one.

## 1.2OpenCv

OpenCV is Open Computer Vision Library [4]. It was initially launched in 1999 by Intel. With more updates, it has been modified since then to aim for the real-time computer vision. This library has been written under programming languages like C and C+. It can be easily run on operating systems Windows and Linux. This library can be easily interface with programming languages like Python, MATLAB, Ruby and others as well. Along with Numpy [6] and Python image processing (shape & color detection) can be performed at ease.

## 1.3Dataset

Colors are made up of 3 primary colors; red, green, and blue. In computers, we define each color value within a range of 0 to 255. There are many ways to define a color. They are  $256 \times 256 \times 256 = 16,581,375$ . There are approximately 16.5 million different ways to represent a color. In our dataset, we need to map each color's values with their corresponding names. We don't need to map all the values. We will be using a dataset that contains RGB values with their corresponding names.

## 2.Steps Involved in color detection in python 3

### 2.11Install Python-OpenCV

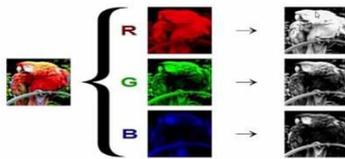
To implement this project, the following packages of Python 3 have to be downloaded and installed: Python 3, NumPy and Matplotlib. According to the default location, Python will be

installed to C drive. Open Python IDLE, import all the packages and start working.

## 2.2 Read an Image From User

First, a sample image in which processing is to be applied is to be read. It's done using a pre-defined Python function: `CV2.imread()`. The sample image should be available in current folder or the full location of the image is to be mentioned as an argument. For reading an image, we can use functions like `imread_color`, `imread_grayscale`, `imread_unchanged`. Etc

### How do computers see images?



## 2.3 Read the CSV file with pandas

The pandas library is very useful when we need to perform various operations on data files like CSV. `pd.read_csv()` reads the CSV file and loads it into the pandas DataFrame. We have assigned each column with a name for easy accessing.

## 2.4 Set a mouse callback event on a window

we created a window in which the input image will display. Then, we set a callback function which will be called when a mouse event happens.

1. `cv2.namedWindow('image')`
2. `cv2.setMouseCallback('image', draw_function)`

With these lines, we named our window as 'image' and set a callback function which will call the `draw_function()` whenever a mouse event occurs.

## 2.5 Create the draw\_function

It will calculate the rgb values of the pixel which we double click. The function parameters have the event name, (x,y) coordinates of the mouse position, etc. In the function, we check if the event is double-clicked then we calculate and set the r,g,b values along with x,y positions of the mouse.

## 2.6 Create the draw\_function

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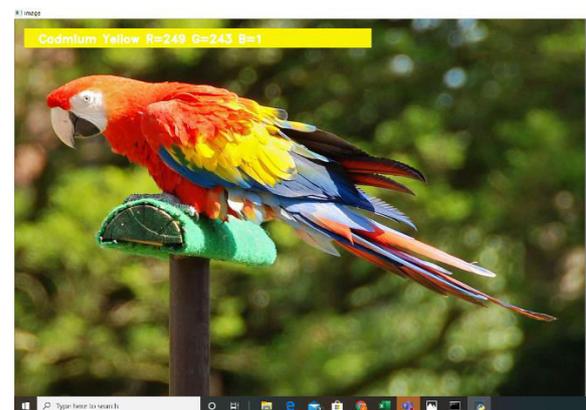
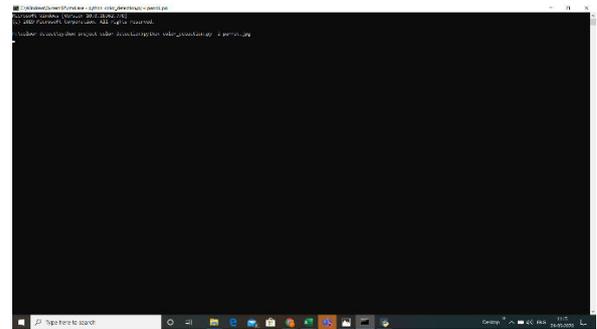
## 2.7 Display image on the window

Whenever a double click event occurs, it will update the color name and RGB values on the window.

Using the `cv2.imshow()` function, we draw the image on the window. When the user double clicks the window, we draw a rectangle and get the color name to draw text on the window using `cv2.rectangle` and `cv2.putText()` functions.

## 2.8 Run Python File

The beginner Python project is now complete, you can run the Python file from the command prompt. Make sure to give an image path using '-i' argument. If the image is in another directory, then you need to give full path of the image:



## 3. Future Enhancements

Computer vision can be used to solve the most intriguing problems with utmost sophistication. All the basics regarding

the detection technique along with different ways to achieve it have been profoundly discussed. During the course of programming, we can use both Python and MATLAB for Computer Vision, but we prefer Python because it takes less simulation time than MATLAB. Someone having prior coding experience finds it easy to implement. This system can be used by the multiple peoples to get the counselling sessions online.

#### 4.REFERENCES

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