What exactly is Color Detection?

The process of determining the name of any colour is known as colour detection. Isn't it simple? For people, this is a simple task, but for computers, it is more difficult. Light is translated into colour by the eyes and brains of humans. The signal is transmitted to the brain via light receptors found in our eyes. The colour is then recognised by our brain. We have associated certain lights with their colour designations since childhood. We will employ a similar method to detect colour names.

Colors are composed of three primary colours: red, green, and blue. Each colour value in a computer is defined between 0 and 255. So, how many different ways can we define a colour? The solution is 16,581,375 divided by 256\*256\*256. A colour can be represented in around 16.5 million different ways. In our dataset, we must associate the values of each colour with their respective names. We used a dataset with RGB values and their corresponding names.

The colors.csv file contains 865 colour names, as well as their RGB and hex values.

Prerequisites

Before starting with this Python project with source code, we need to know about some of the computer vision library of python such as Open CV and Pandas.

OpenCV, Pandas, and numpy are the Python packages that are necessary for this project in Python.

About the Python Project

In this color detection Python project, 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.

The project folder contains 3 files:

Color\_detection.py – main source code of our project.

Colorpic.jpg – sample image for experimenting.

Colors.csv – a file that contains our dataset.

2.we 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.

3. Set a mouse callback event on a window

First, 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.

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.

4. 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.

5. Calculate distance to get color name

We have the r,g and b values. Now, we need another function which will return us the color name from RGB values. Our distance is calculated by this formula:

d = abs(Red – ithRedColor) + (Green – ithGreenColor) + (Blue – ithBlueColor)

Summary

In this Python project with source code, we learned about colors and how we can extract color RGB values and the color name of a pixel. We learned how to handle events like double-clicking on the window and saw how to read CSV files with pandas and perform operations on data. This is used in numerous image editing and drawing apps.