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Color Detection of RGB Images Using Python and OPENCV

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Abstract: This application intent is to accomplish the explicit strategy to recognize the miscellaneous shades of colors precisely. According to study of sciences, a normal healthy human can identify and differentiate nearly one million shades of color. But it is impossible for an individual having "enchroma". It is indispensable for a painter to recognize different color patterns precisely to make realistic images
Keywords: Enchroma, RGB value, OpenCv, pandas

I. INTRODUCTION

It is crucial to have basic understanding of color detection before we commence analyzing the project. Color detection is nothing but the action of recognizing the name of the color. Unlike computers, we humans can do this effortlessly by nature.
The coordination of eyes and brain make it possible to recognize colors. This happens by transmitting signals to brain through light receptors present in our eyes. In this project, we are going to apply this strategy of natural process to detect color names.
We can track three different colors Red, Green and Blue with the knowledge of basic principle of computer vision. By simply giving path as an argument, a window reroutes to the image displayed on it with color name of each pixel and composition of red, blue and green colors upon successful compilation and execution of code.

The immense application of this color detection by computers are as follows:
1) Robotic arms which chooses different things by detecting the colors
2) Apps like image editor and drawer
3) Driverless cars in which it detects traffic light signals and take decisions appropriately

II. METHODS AND MATERIAL

A. Image Capture

As a first step, a high quality image with resolution has to be taken. we use the following piece of code Cv2.imread() to fetch image from working directory or the path of image should be mentioned like Img=cv2.imread(img path)

B. Extraction of RGB Colors

Extracting three layered colors from the image that we have given as input takes place in this phase. Merely by merging red, blue, green lights all the color images on displays of television, mobiles, computer, laptops, monitors are created.
All other different colors are produced by combining different intensity levels of three primary colors. The intensity value of each primary color ranges between 0 to 255
Index=["color", "color_name", "hex", "R", "G", "B"]

C. Calculating Minimum Distance from Coordinates

Calculation of minimum distance can be done by preceding towards the origin point from all the colors which in turn yields the most suitable color.
Different operations on comma separated values can be performed using library called pandas.
Example: pd.read_csv()
The above piece of code can be used to read and load csv file in pandas data frame.
D = abs(R-int(csv.loc[i ,"R"])) + abs (G-int (csv.loc[i ,"G"])) + abs (B- int (csv.loc [i ,"B"]))

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D. Image Display with Shades of Color

With rectangular window, we can display image with varying shades od color. RGB value and color name are updated in response to double-click action.

code	operation
Cv2.imshow()	Displays image
Cv2.rectangle	Gets color name
Cv2,putText()	Gets intensity level

text=getColorName(r,g,b) + 'R='+str(r) + 'G='+str(g) + 'B=' +str(b).

III. SYSTEM ARCHITECTURE

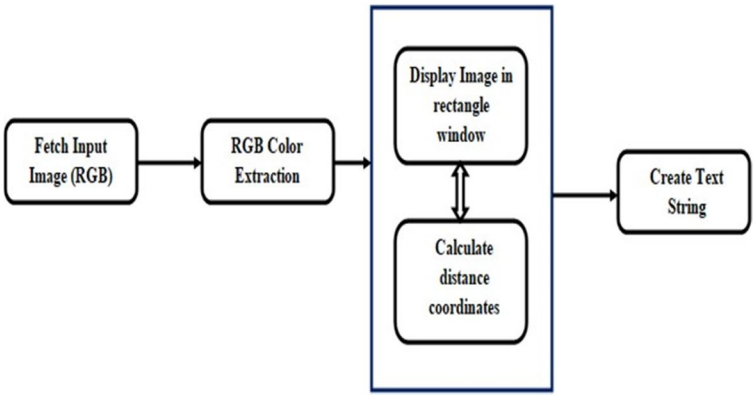


Figure 1 : Architecture Diagram

The above well defined architecture is structured with with the help of sequence diagram obtained from the source code. It makes use of rich functionalities like python Opencv library.

Using the above architecture, the process will be more efficient since it is built on principles and properties that are interconnected to each other. The current color detection project aims to get composition of different colors red, blue, green from the given image.

IV. EXPERIMENTAL RESULTS



(a) (b) (c)

Figure 2: (a) Original input image of nature (b) Output image with Color intensity RGB values as R=49 G=52 B=21 for Olive Drop (c) Output image with Color intensity RGB values as R=18 G=88 B=186for Sapphire

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(a)





(b) (c)

Figure 3: (a) Original input image of Salt Lake (b) Output image with Color intensity RGB values as R=3 G=9 B=97 for Royal Blue (c) Output image with Color intensity RGB values as R=252 G=229 B=13 forGolden Yellow

V. CONCLUSION

Our main goal is to fetch the appropriate and precise color field from an RGB image with the help of python library called Opencv. Using this opencv, numerous steps of code have been implemented. The superior merit of this method is that color differentiation achieved from monochrome images.

As a further development, this edge detection technique can be used to various other applications like facial detection, grey scale color conversion etc.

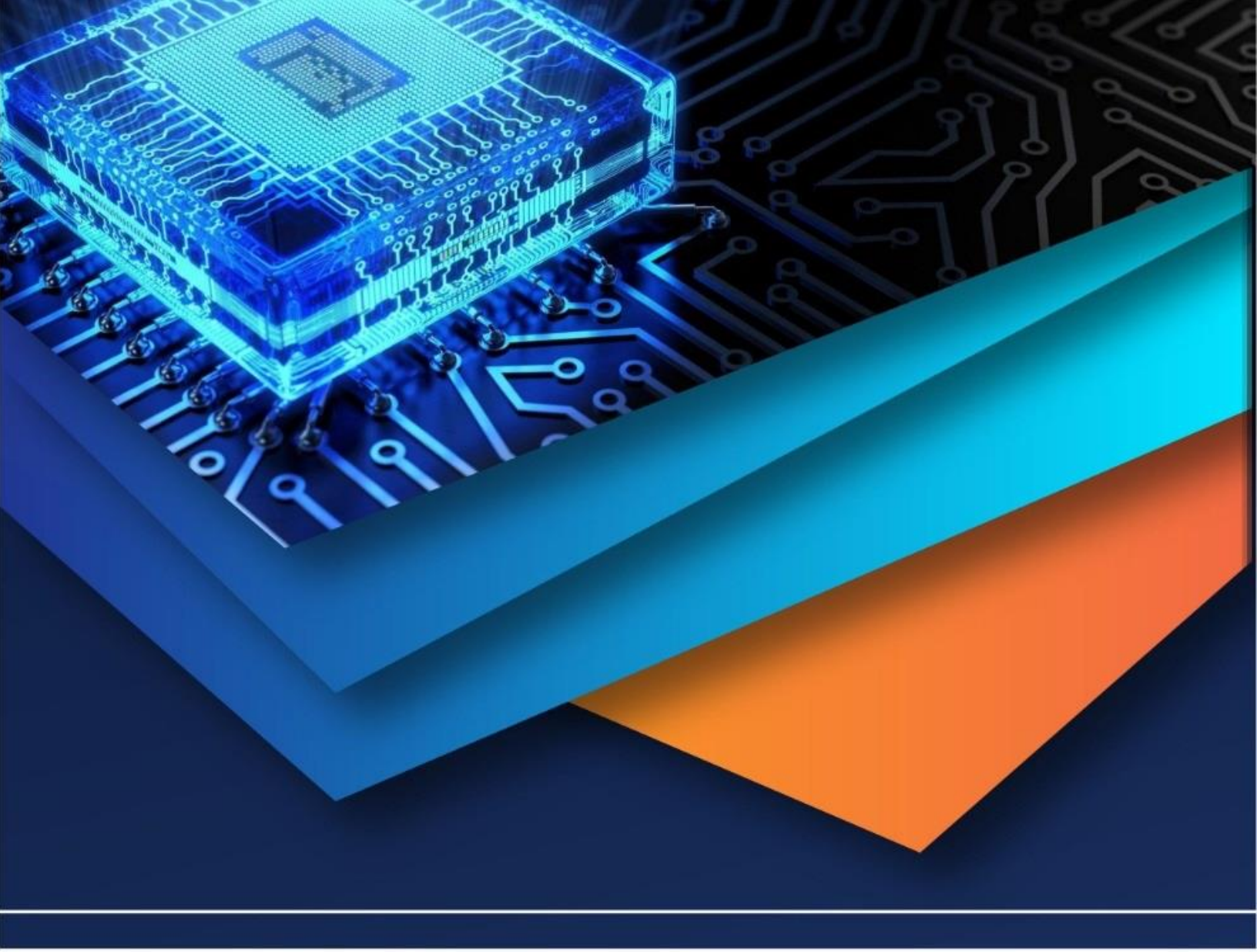
VI. FUTURE WORK

As there is no precise color representation in the exising system, we introduce a new system to integrate cv datasets that can able to recognize 865 shades of colors along with their respective RGB and hex values. In our new system, the cursor automatically displays the RGB values by clicking on image and it use opencv for sorting primary colors

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