GRAPHIC ERA HILL UNIVERSITY

DEHRADUN, UTTARAKHAND

Mini Project Report on

COLOUR DETECTION

Submitted in partial fulfillment of the requirement for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE & ENGINEERING

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Color Detection System

Abstract— A Color detection technique is a program that gives the color of what user asks for as output. In this method the color codes already provided in the program are compared it with the image whose colors we want to know. Let us first began with why is it needed? We know of a disability in humans very commonly found "color blindness" it is very common in humans but mostly people manage with it, as if you don't go deeply about the colors it won't cause any problem to you in general activities.

What is color Blindness?
It is a disability in which the person suffering from it is unable to see some colors (fun fact: his/her vision is not black and white) the colors not visible depends on type of Color Blindness. This disability makes a person impaired from doing task which involves selection of colors like choosing clothes, buying vegetables, fruits or even while travelling (Traffic lights or other cars lights).

Self-drive cars are the future and they require color detection to easily commute on road. It is true that, there is no cure for color blindness currently and it is also true that no one has seen the future. But right now what we can do to atleast is to solve this issue temporarily (not close to reality but start is always small). Recognition of colors from an image and then from live video has been done by many, we have also tried to do the same. We have successfully detected color in the image, now in the next step we are going to implement the live video color detection. In the program the R,G,B values of colors are to be compared with the that of the image and then display the name of the color that will be easily visible to the user, this system can help in knowing the colors to normal people(especially men) and hence this system can be very useful and it do have the future use for like connecting this system in the goggles or

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specs and also in helmet for those driving motorcycle, these all things might seem of no use now or to most people but all those people suffering from it most probably find it very useful. As it will help them recognize the color(even if not by seeing them but recognizing them). Hence it can be easily said that this program will help many people if implemented.
Index Terms- Color detection, color blindness.

1. LITERATURE REVIEW

It provides a summary of the color detection technique and recognize it and then display the color-name to the user. This method works currently on the given image. The pros and cons are supplied. It has a huge collection of colors that will definitely give output even if the color is formed because of provided with good quantity of colors so as to get the huge set of comparison and and a very low chance of getting wrong color or no color, this program has been designed as a program having very low sensitivity. OpenCV has been used in this program.

How Does Color Detection System Works?
Color detection is the act to detect and identify the color in the image/video asked or clicked on.

mixture of two or many colors. Hence the program has been It captures, analyzes, and compares the R,G,B value and gives the corresponding color.

1. The Color detection process is an important step because it detects and saves the colors of images and videos.

2. The image capture process the converts analogue (color) information into a set of digital data (R, G, B values).

3. The color recognition process compares and confirms whether the two colors same or not.
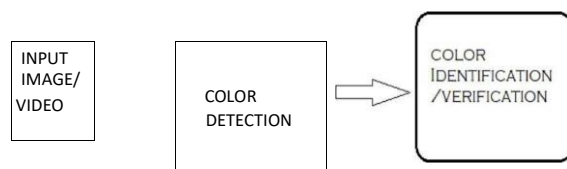
How this system helps?
Color detection can easily be implemented and helps the user to get the colors easily. Colors are as true as the sun or the moon and is always present in the environment, but unlike normal people, people suffering from color blindness can't easily identify the colors. We are seeing an increase in people

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suffering from this and we know that it can be very frustrating to not able to see the colors what least can be done is to tell them the real colors name. ally based on clusters, taken at the time of arrest, before the judge includes the possibility of conviction or innocence. Mugshot photos are often not far from the details, even though the detainee has never been charged.

The Role of OpenCV
The OpenCV is an open source library of computer vision and image processing etc. It plays an important role in real time image operation, and it is an important part of today computer systems. By using this software the user can process image, detect objects and this library of OpenCV is gradually evolving because of its ability to perform more complex tasks in processing images etc in a consistent manner. This library has been applied extensively in companies, public bodies (like Government bodies), well established software companies like Google, Yahoo, Microsoft, Intel, IBM, Sony, Honda make extensive use of OpenCV.

OpenCV is highly rated as it involves state of Art Computer Vision and Machine Learning algorithms, Deep Learning etc.

Deep Learning helps in self driving cars and those cars will be using OpenCV to gather colors either be it on road traffic lights or other cars light, it may can passing light, stop light or indicator lights.

11. REQUIRED TOOLS

Requirement analysis is involved in defining customer needs and objectives in the context of planned customer use, and system features identified to determine the needs of system functions.

User Requirements
User engagement with factual statements and assumptions that define system expectations based on objectives, environment, issues and measures of efficiency and effectiveness.

Basically, users need:

i) A system that improves the efficiency of data retention and retrieval. ii) An easy-to-read and use system iii) A system that speeds up the processing of transactions iv) A flexible, secure and flexible system

Hardware and Software Requirement

i) Operating system: Windows 7 ii) Software: Intel i5-8th gen Processor iii) Processor 2.0 Ghz processor speed iv) Memory of about 2GB RAM

v) Visual Display Unit 800*600 colors (Min.) vi) The platform for executing the code for Color Detection. E.g.: Spyder, Jupyter Notebook, IDLE, SUBLIME TEXT etc.

Problem & Challenges:
Over the time, academic computer engineers, theoretical vision researchers and commercial product developers have enhanced the performance of automatic color detection algorithms in the spread of speedy processors and algorithms to detect the colors. This is what is required and have been implemented Since people are currently interested in quick and rapid operations in many real-world situations. An important challenge in color detection and similar technologies is the ability to handle all those situations where subjects (whose color is to be detected) are not in close range and hence color cannot be differentiated and hence detection becomes tough and may lead to wrong results or no results. There are many factors that make the color detection easy or tough.

These sources of variance are divided into two groups: Internal and External Features

Internal factors: - are caused by the sensors that is the camera of the system and are independent of the observer

External factors: - make effect on image coming to the camera with the combination or interaction of the sunlight, rain, dirt storm etc or even due to dirt on camera.

MERITS OF PROPOSED SYSTEM

I.Our project of Color detection System can work in any computer with minimum specification.

2.   The detection process process takes less than a moment and this is very beneficial for companies.

3.   The first thing to start with is observation. With the help of Color Detection, it will be easy to identify the color and give its name to the persons using it.

4.This project is made to reach each and everyone in the society suffering from color blindness so that everyone can get benefit from this.

5. Color Detection technology is very accurate and no one can doubt it.

6.The project designed by us can be used through basic camera also. No special cameras are required for its basic functioning,

7. But for using it as an assistant in self drive cars the camera should be good and more than one should be used for getting an overall view around the car. And all the cameras should be File Edit Format Run Options Window Help connected to each other. ARCHITECTURE DIAGRAM

The image below shows how the complete process of color detection is carried out.

IMAGE

color_detection.py

C:\Users\prasa\OneDrive\Desktop\Color detection\color_dete

```
import cv2 import
pandas as pd


          picl  .   jpg
csv_path = colors . csv'

# reading csv file index = ['color' , color name'
       ' hex '  R', 'G','B' ] df = pd. read_csv
(csv_patK, names=index, header=None)

#  reading  image  img  =  cv2.
imread   (img_path)   img   =
cv2.resize (img, (800, 600) )
```

```
                    Module Il: Image Processing
┌─────────────────┐   •      In this module, when the program is executed the
│                 │   program opens a window of size 800*600 image pixel are
│                 │   processed an the program loads the image in the window.
│  IMAGE          │
│  PROCESSING     │   •      In this module, the programs run over gives the image
│                 │   for further operation.
│                 │
│                 │   •      When all the images are perfectly processed and the
└─────────────────┘   program is ready to detect the color.
┌─────────────────┐
│ CLICK  ON  PT.  │
│ WHOSE           │
│ COLOR IS TO     │
│ BE             │
│ CHECKED         │
└─────────────────┘
```
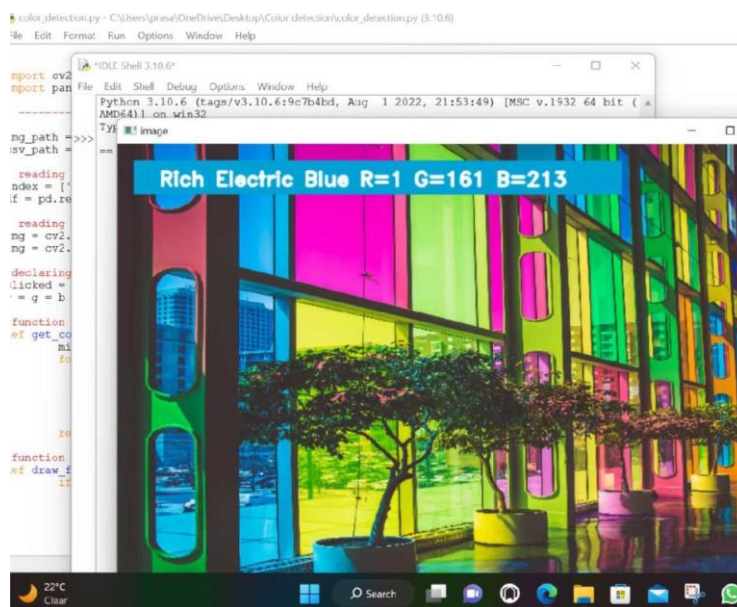

PROJECT   MODULES

1.Module 1: Capturing and Storing Image :

- In this module, the capturing of image takes place. The image stored in this process is later used for detecting the color.

- The program stores the image and resizes it to 800*600 pixels of image the user gives in as input. The reduction of image size and leads to judicial use of the storage provided.

                    Color Detection System
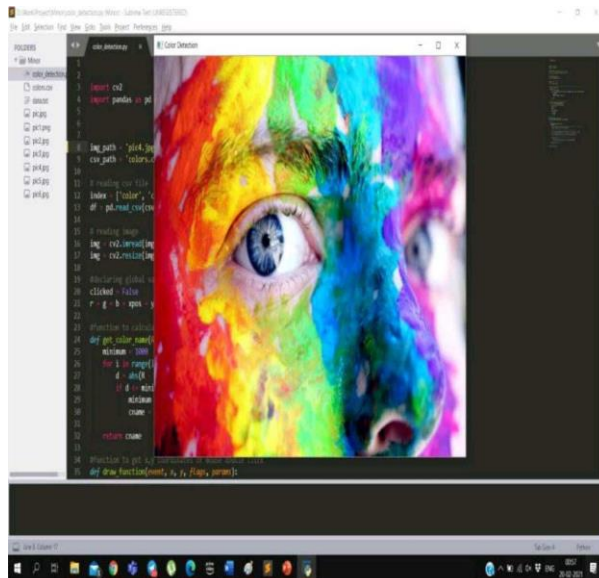
In the above image it is displayed how the name of the color is displayed along with the R, G, B values of the point on which the image is clicked

Deep Sky Blue R=1 G=185 B=255
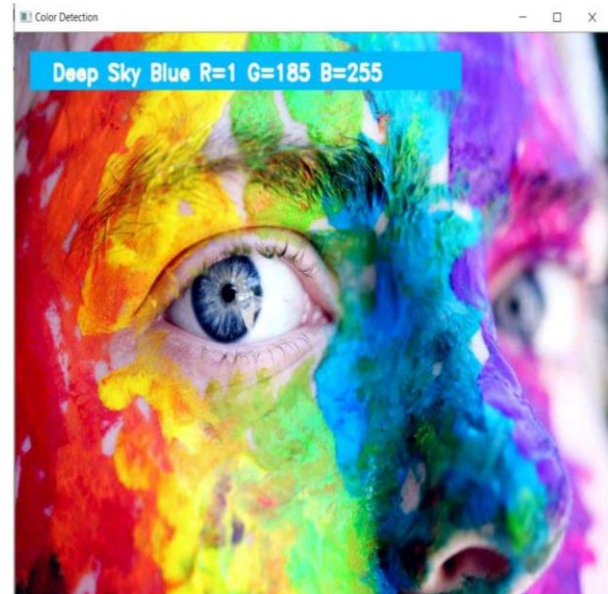
Module III: Color Detection

- In this module, the programs has completed the Image Processing and is ready to take the input of the user.

- The program which is already displaying the window can now be clicked anywhere and it will display the color present there.

  - The user Clicks on the image anywhere of whose color he wants to know.

When the user double clicks anywhere he gets the color name alongwith their R, G, B values.

Laser Lemon R=249 G=237 B=39

Maya Blue R=100 G=181 B=254

❖ This is the execution phase of the color detection system is completed.

❖ In this phase, the color is detected using image and the programs runs over after esc key is pressed.

❖ Here the face matches the stored images above 75%, therefore, it displays message "Unlocked".

display the color present there.

111. CONCLUSION

Color detection technology has come a long way and has a long way to go. When we see selfdrive cars running on roads by themselves following the traffic rules. Today, the machines are ready to for it. Tesla is a frontrunner in this technology. However, next-generation color detection programs will have more upgradations. The apps in smart environments - where computers and equipment are similar to assistant assistants.

To achieve this goal computers must be able to reliably identify nearby things and their basic properties like size shape and color(we can't forget that) in a manner that is naturally consistent within the normal human pattern. They do not require special interactions and should be in line with people's understanding of when recognition goes. This suggests that future intelligent environments should use the same methods as humans, and have the same limitations. These goals are now achievable.

REFERENCES

[1] The   chemistry of john Dalton 's   color   Blindness. https://pubmed.ncbi.nlm.nih.gov/

[2]
    OpenCV— medium.com

[3]
    Color Blindness — Wikipedia

[4]
    Color detection —Medium.com