Institute of Engineering & Technology
Lucknow

Master of Computer Application
2020-2022

Project Report

Mini Project KCA353:

"Image Color Detector"

By

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Under the Guidance of:

Mr. Natthan Singh (Supervisor)…….

Ms Pratibha Pandey (Co-Supervisor)…….

DECLARATION

I am just going to discuss my work on this project which is named as “Image Color Detector” .It is a reward of my successful completion of Master of Computer Application from Institute Of Engineering And Technology (IET) Lucknow Uttar Pradesh, and all the work which is carried out during the period from September, 2021 to February, 2022 under the supervision and guidance of Mr. Natthan Singh And Ms Pratibha Pandey.

Student signature:-

Ashish Sharma **Ashish**

....

Place:
Date:

CERTIFICATE

This is going to certify that the project report named as “Image Color Detector” has been submitted by Mr. Ashish Sharma and Mr. Ashish, those are the apprentices of Degree Master of Computer and Application (MCA) from Institute of Engineering and Technology (IET) Lucknow (UP). And as a record of their successful knowledge and work carried out by them are submitted. The project was built under the guidance and supervision.

The work is this project report can be submitted to any University or other institute as a reward of any Diploma or Certificate.

Mr. Natthan Singh

(Project Supervisor)

Ms. Pratibha Pandey

(Project Co Supervisor)

Dr. Upendra Kumar

(Project Coordinator)

ACKNOWLEDGEMENT

'Image Color Detector' is the final year project for the department of Computer Application Institute of Engineering and Technology, 2022 batch this report is prepared by Mr. Ashish Sharma and Mr. Ashish under the guidance of Mr. Natthan Singh (IET Lucknow) and Ms. Pratibha Pandey (IET Lucknow). First of all we would like to show our respectful emotions to our Project Coordinator Dr. Upendra Kumar Upadhyay Sir and other faculty member of the of the IET college who gives us a wonderful opportunity to work on this project. We will also always thankful to all other faculty member of the Institute Of Engineering And Technology, Lucknow, who provides their full support and gives as ideas whenever we asked with them. Whenever there is need of guidance and supervision me they helped us by sharing their ideas and concepts. We are thankful to all of the people who helps us directly or indirectly during this project.

Student signature:-

Ashish Sharma Ashish

ABSTRACT

As we know that a RGB image is a combination of Red, Blue and Green colors. And also the in RGB system ever color is valued from 0 to 255. Thus there are 255 times 255 times 255 color combinations can be formed. Even human eyes cannot differentiate between them. Human have their own intelligence to recognize these color, but a computer or a Machine don't have as much as intelligence as human. So here we are using Artificial intelligence concepts we will try to find the particular color of the object. We will use OpenCV library of python to detect. But in real life, color detection is also necessary for example in skin detection, face detection, flower detection and vegetable and fruit detection. So this project presents the methodology to extract a certain color from an image.

This application will also help to detect the object on the basis of its color, as we know that every vegetable and every fruit have a unique color by which we can identify them by human intelligence. Our system which is easily accessible to the public. This machine learning project will be quit helpful in the upcoming days in future. Using Python language techniques, Spyder IDE, openCV, NumPy, Pandas, And many more library are use in this project. For designing the project as GUI we use tkinter.

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Introduction

Before going to the Project report it is required to know that what actually the Color detection is! It is nothing but a simple process to find the name of the color. In human it is performed naturally and no requirements of any effort, but is computer it is not being naturally and it not same process for the computer.

As we all learned in class 10^{th} and 12^{th} the concepts of human eyed and light. A white light when passes through a prism then it is divided in to 7 color as VIBGYOR. Light receptors are presented in human eyes that provides signal to the human brain which is used to recognizing the color. And human eyes mapped that color with the color name which a person knows from their childhood. We will use the same color detection technique to get color name.

We will use fundamental concepts of Computer Vision. We will tracked Red, Green and Blue Colors. After successful compilation the code will execute on the GUI window and image will be displayed whose path is given as argument.

Additionally we will get a RGB color value by clicking on the image displayed on the window. Color will be displayed with color name and RGB color values. It is very useful in detecting color and in robotics also. This methodology is used in computer vision, object separation, tracking. And there are a lot of area, where color detection is very useful. In now a days in Instagram Facebook everyone uploads there edited and filtered image. In editing and filterization color detection techniques are used.

Related Works

Color Detection of RGB Images Using Python and OpenCv:

Some of the Assistant Professor of the Qis College of Engineering and technology, Andhra Pradesh, work on this project. I read their research paper and find this concept to make a project on Image color detection. Artificial Intelligence techniques are used in a Color detection. This project will also help to identify the actual color of a particular object like vegetable, fruit of any other thing which have an RGB color component.

P. Raguraman, **A. meghana**, **y. Navya** and their team works on this Project.

Different Color Detection In An RGB Image:

Arshi Prabhakar, **Neeti** and **Rakhi** Devi ECE, Guru Nanak Dev University, these are the person who about color detection and published this research paper. The main objective of this research paper to identify different color form a same object. This project will help in the future to recognize the object by detecting their color. MATLAB command are used to extract the color from image. RGB Image Format, Binarization, Thresholding, and image processing techniques are used in this project.

Proposed System

The primary objective is to develop a system that can detect color from and RGB Image, image that is given by the user, taken as an input. And clicking on the different points on the image it will return a color name with RGB color combination. A csv file is use to find the different color according to the RGB color combination.

There are two different module of the Project:

- **Image_Dectector:** In this module the image in given by the user to and then image are opens in a rectangle. When image is displayed then you have to click on the image on different color and you will get a color name at the top of the image.
- **Live_Detector:** In this module the image is captured at the live camera photos, and when the image is capture, it will show in a rectangle, then the previous process will be repeated and thus on clicking on the image you will get your desired result.

Whenever an image is captured or given by the user the image are store in the variable as runtime, there are no requirement for database. Image is captured directly and excel file of different color are also used by which all the color are fetched and filtered.

Tools and Technology Used

IDE(s): IDE is stands for Integrated Development Environment. Which is used to by a developer to write code and for compile and run th code. There are a lot of IDEs are available in the market. We are using here Spyder(Anaconda3) and Visual studio Code for write the code and testing the code. Both the IDEs are very helpful and reduced a programmer efforts.

Language: As we know for developing and implementing a project a programming knowledge is required. So we are using is Python language. Which is an Object oriented Programming language. There are a lot of library which is quite usefully image processing and may AI and ML Projects.

Concepts: As we are studding about the properties of an Image then we will Image processing concepts. Where all the fundamental of image is summarized. We will use the concepts of Artificial Intelligent which is a upcoming new technology.

Library used: we are using here libraries of the python language. Like OpenCV which is used for import image from the database to our program. Numpy library is used to playing with database sets like arrays and tables. Pandas library is used access the dataset from the library. And Tkinter library is used to give a graphical representation to the Program.

In other technologies we will use csv file where all the color information is stores. And will use MS offices properties to woks on the documentation and a webcam is highly required to detect the object and capture the image.

Methodology

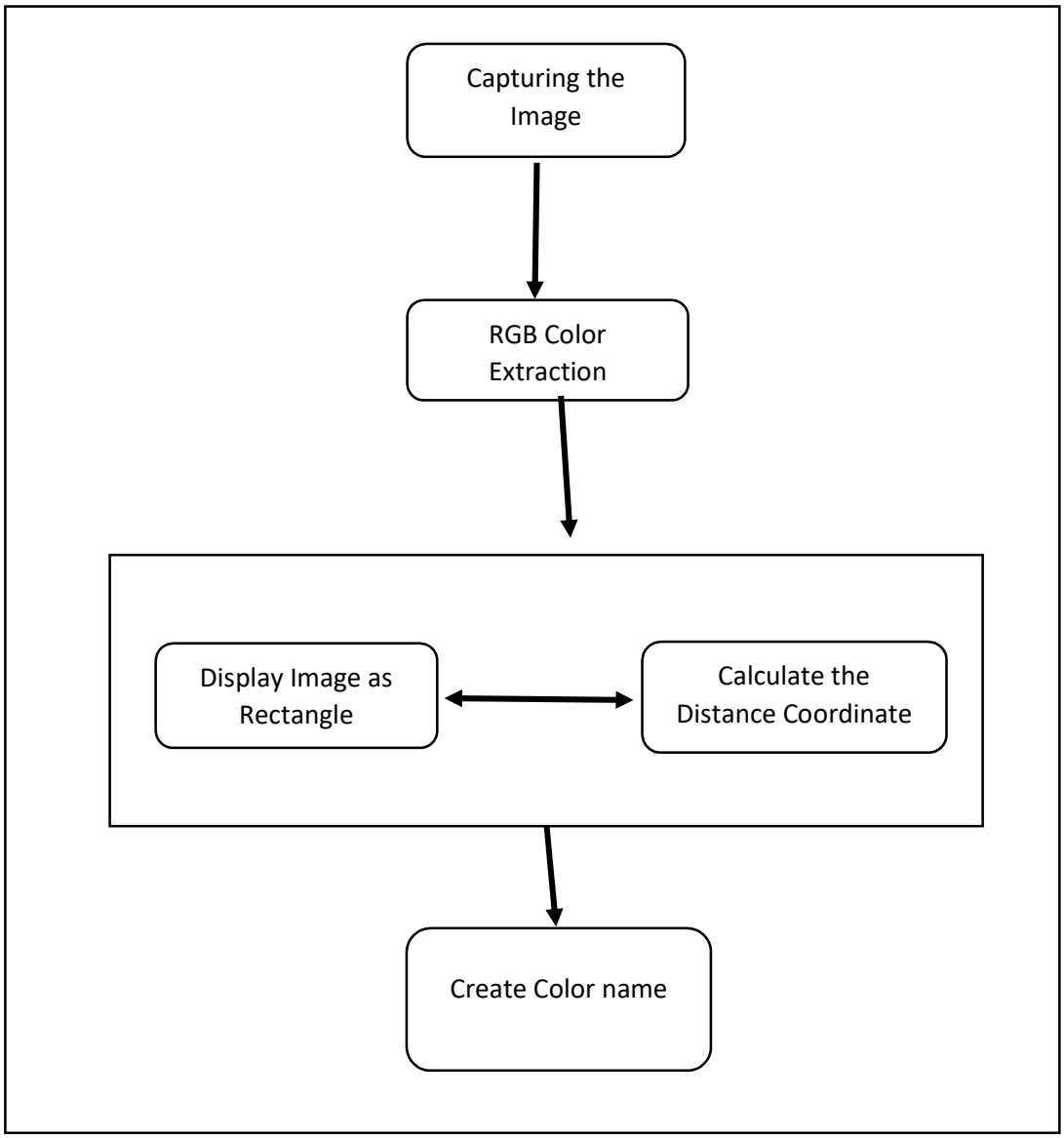

Figure 1. Architecture Diagram

In figure 1 the whole architecture of the Image color detector are shown. first the image is captured by the camera, then RGB color extraction then display image in rectangular shape and after that color name will be printed at the last.

Snapshots of the Project

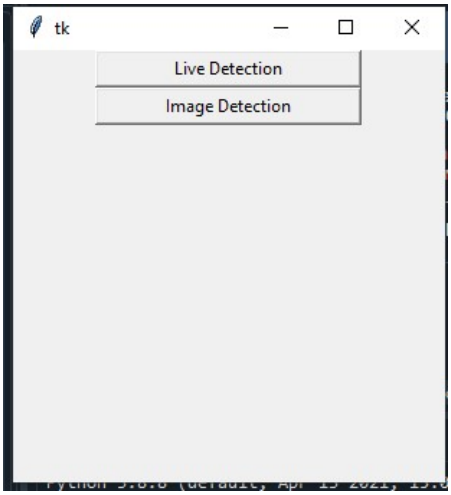

Figure 2 Home Window

In figure 2 the initial window is presented where two button is displayed which are depend upon some different module as the name suggest they works as live detection and image detection.

Image Detection:

Figure 3(a)

Figure 3(b)

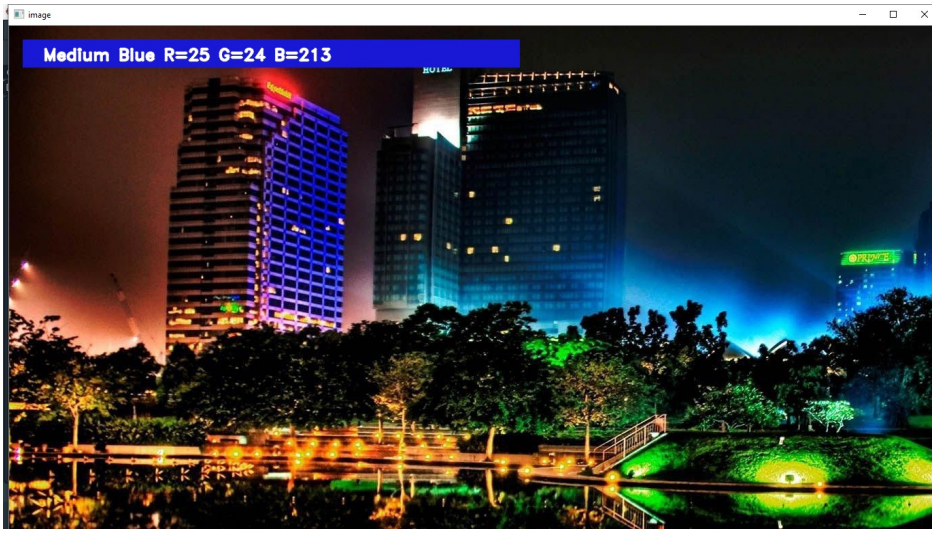

Figure 3(c)

In figure 3(a), 3(b) and 3(c) the Process of color detection is shown. First image is displayed and just double click different pixels we will get particular color of that particular pixel as in figure 3(a) is displayed image, in figure 3(b) is displayed lime green, in figure 3(c) is displayed Medium Blue.

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Live Detection

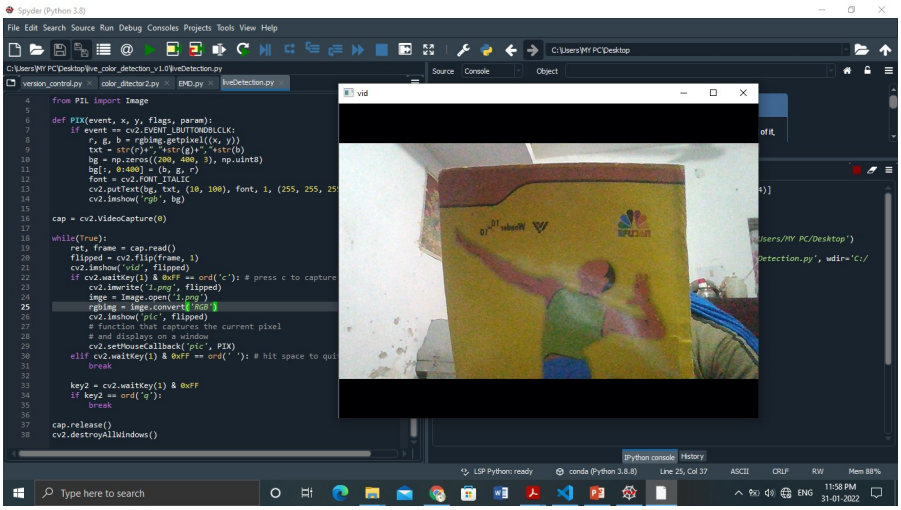


Figure 4(a)

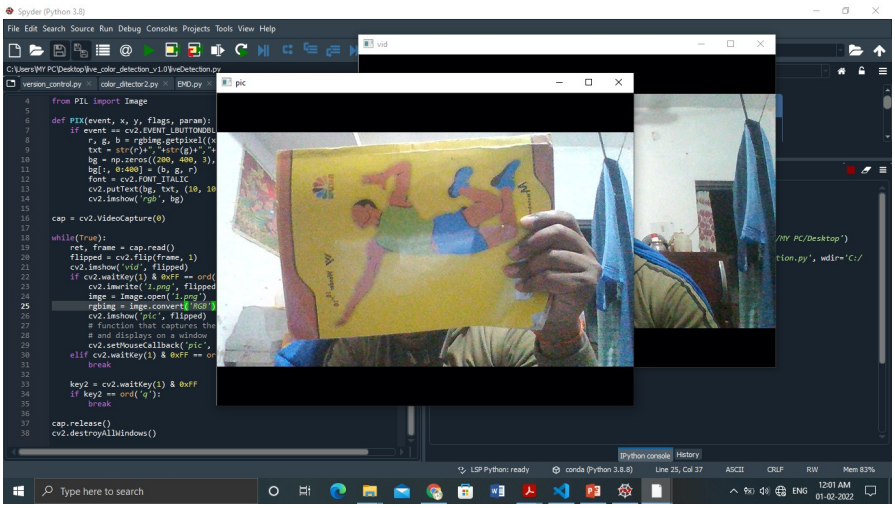


Figure 4(b)

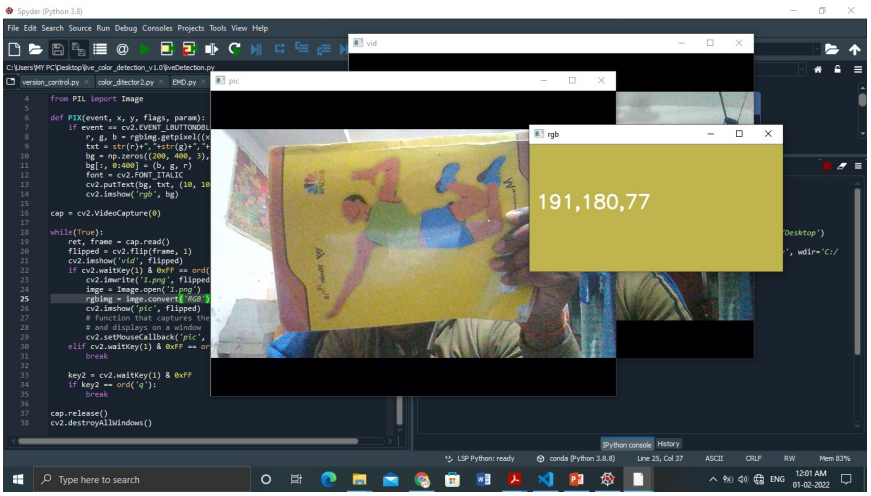


Figure 4(c)

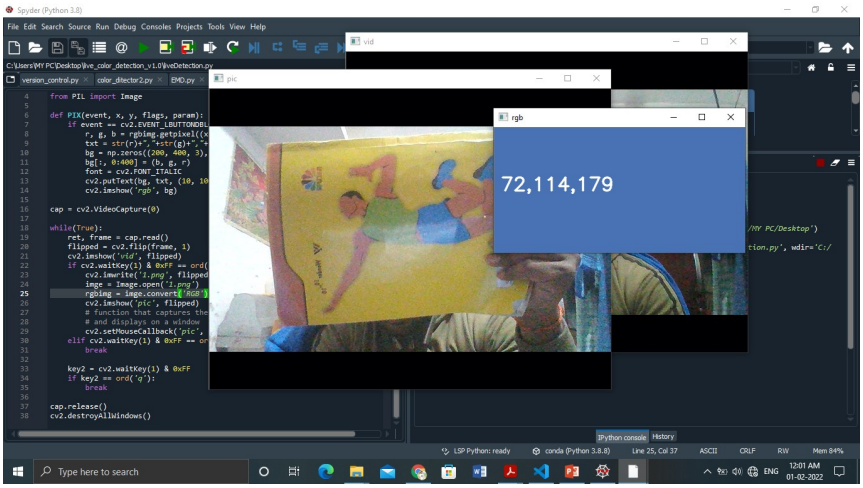


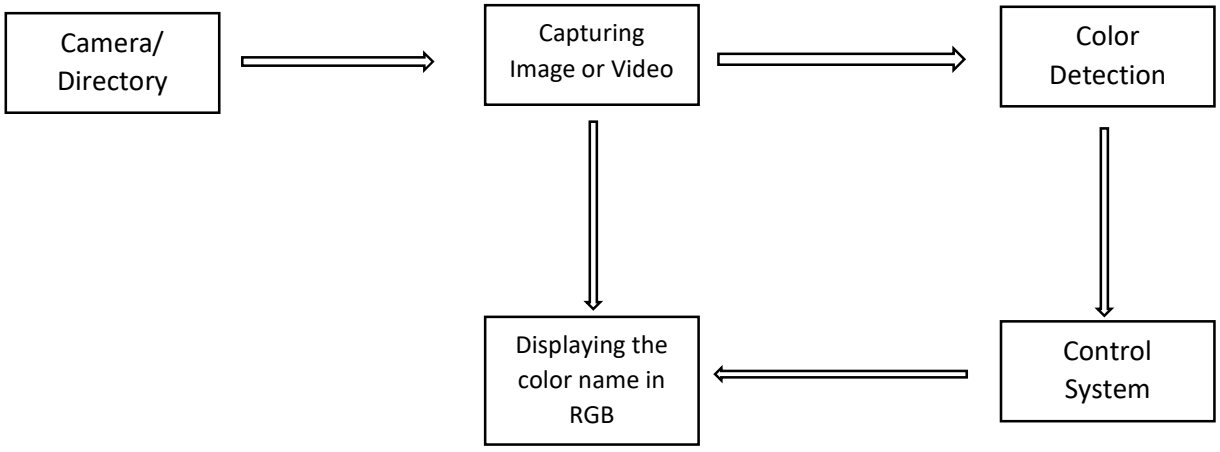
Figure 4(d)

The output the second module are shown in the second module are shown in the figure 4(a), 4(b), 4(c), 4(d). In Figure 4(a) the camera open and ready to capture the image. In figure 4(b) captured Image is displayed in a rectangular shape. In Figure 4(c) the yellow color with RGB combination displayed on double clicking the particular pixel. And at last figure 4(d) displayed the blue color with RGB color commination. We can get the color name using any RGB color system application.

Data Flow Diagram:

0-Level DFD:

1-level DFD:



Application of the Project:

- **COMPUTER VISION-** Computer vision is concept and a library which is highly used is image Processing. Color detector is a basic and fundamental step to understanding the image Processing. A lot of methods and functions are available in this library. Like object reorganization, Face detection and fire detection etc.

- **Automated Driving-** now a days automatic cars are available in the market. In the traffic signal capture red and green signals they can take decision to drive or Stop.

- **By unique objects-** Like in a water disaster computerized machine can detect that which are is one wet using the color of soil or trees.

- **Track vehicle-** A vehicle can be tracked on the basis of its color.

- **Online shopping-** like Flipkart and Amazon, we can search out desired colored product.

Plan of Work

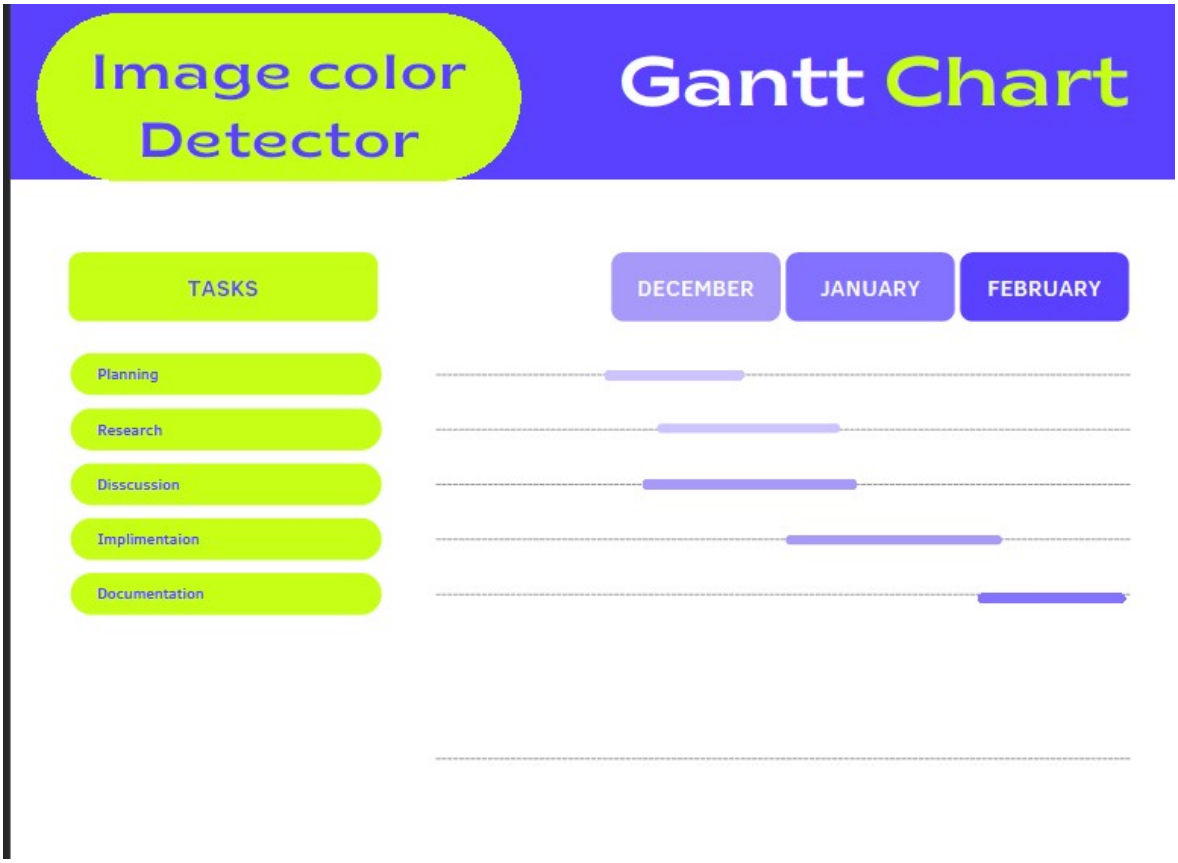


Image color Detector
Gantt Chart
TASKS
DECEMBER
JANUARY
FEBRUARY
Planning
Research
Disscussion
Implimentaion
Documentation

Conclusion

Thus we discussed all the functionality of the project ‘Image Color Detection’. There are various steps which are used during implementing the concepts of python library like OpenCV, tkinter and pandas. The main objective of the project was that to identify the different RGB color used in an Image.

In future scope we will introduce a lot of method which will change the color of the pixel which we finds as output. Color conversion facial detection will be also implemented in the upcoming days.

Reference

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