INDIRA GANDHI DELHI TECHNICAL UNIVERSITY

IGDTUW- ANVESHAN FOUNDATION

IGDTUW CAMPUS
KASHMERE GATE, DELHI-
110006

FULL STACK DEVELOPMENT WITH PYTHON

(JUNE 20- JULY 30, 2022)

PROJECT REPORT

Submitted in partial fulfillment of the requirements for the award of the

-INTERNSHIP-

Submitted By :

RINKI

RAGHUWANSHI

MCA(NITP)

INDIRA GANDHI DELHI TECHNICAL UNIVERSITY

INDEX

1. Undertaking regarding anti-plagiarism
2. Acknowledgment
3. Declaration
4. List of Abbreviations
5. Summary
6. Introduction
   - 6.1. Literature Review
   - 6.2. Scope of training project
   - 6.3. Work Contribution
7. Project_Name
   - 7.1. Problem Statement
   - 7.2. Suggested Solution
   - 7.3. Feature and Description
8. Conclusion
9. Resume
10. Bibliography

UNDERTAKING REGARDING ANTI-PLAGIARISM

I, RINKI RAGHUWANSHI hereby, declare that the material/ content presented in the report are free from plagiarism and is properly cited and written in my own words. In case, plagiarism is detected at any stage, I shall be solely responsible for it.

RINKI

RAGHUWANSH

I

ACKNOWLEDGEMENT

The satisfaction that accompanies the successful completion of this project would be in complete without the mention of the people who made it possible, without whose constant guidance and encouragement would have made efforts go in vain. I consider myself privileged to express gratitude and respect towards all those who guided us through the completion of this project.

I convey thanks to all the mentors of this course for providing encouragement, constant support and guidance which was of a great help to complete this project successfully. I would like to express my special thanks of gratitude to the IGDTUW Anveshan Foundation who organised this course and gave an opportunity to the students to learn and grow. Additionally, the constructive feedback helped me learn the basics of Full stack development with python and encouraged me to do work on wonderful projects, one of which was **"Colour detection"**.

Lastly, I would also like to thank my parents, friends, and my teammates who helped me a lot and encouraged in the research for this project within the limited time frame.

RINKI

RAGHUWANSHI

DECLARATION

I, **Rinki Raghuwanshi**, solemnly declare that the project report, **Colour Detection,** is based on my own work carried out during the time of the course. I assert the statements made and conclusions drawn are an outcome of my research work. I further certify that:

I. The work contained in the report is original and has been done by me under the supervision of my supervisor.

II. The work has not been submitted to any other Institution for any other degree/diploma/certificate in this university or any other University of India or abroad.

III. We have followed the guidelines provided by the university in writing the report.

IV. Whenever we have used materials (text, data, theoretical analysis/equations, codes/program, figures, tables, pictures, text etc.) from other sources, we have given due credit to them in the report and have also given their details in the references.

Rinki

Raghuwanshi

LIST OF ABBREVIATIONS

This section includes the list of abbreviations used in the document.

Abbreviation	Description
R	Red
G	Green
B	Blue
Cv	Computer Vision

SUMMARY

Light is converted into colour by the human eyes and brain working together. Our eyes have light receptors that send the signal to the brain. The colour is then recognised by our brain. We have associated specific lights with their colour designations since we were little. In Image Color Detection Using Python, we will employ an approach that is fairly similar.

In this Color Detection Python Project, we'll create a tool that will enable the user to click on any colour to instantly learn its name. The libraries pandas and OpenCV are used to automatically identify the name of the colour. We will thus have a data file for this that provides the name of the colour and its values. Then we will measure the separation between each colour and determine which is the shortest.

INTRODUCTION

It is crucial to understand the notion of colour detection before delving into the project's speculative aspects. Finding the name of any hue is all that is involved. It is apparent that humans carry out this behaviour automatically and without exerting any effort. However, this is not the case with computers. In order to convert light into colour, the human eyes and brain collaborate. The brain receives the information from light receptors in the eyes and perceives the colour as a result. It's hardly hyperbole to suggest that since childhood, people have assigned colour names to certain lights. The same method works well in this project to find colour names.

Segmenting and recognising the segmented colours is the process of colour recognition. One of the human-computer interactions is this one. In this case, colours serve as a computer and human interface. When first employed for a recognition procedure, the primary colour modal only recognises basic colours. Primary colours are divided into segments in every colour picture, and segments are named according to their colour, such as red, green, and blue. Two methods are used to produce the recognised colour: writing text on the output screen and playing audio (.wav) files with the names of the main colours. After segmenting it, the pixels for each of the three hues are tallied.

It should be able to tell that the specified colours have been identified whenever there are more than 300 pixels of these three colours (RGB). We set that no objects are present in the area below 300 pixels. It could be a result of light diffraction. Therefore, it shouldn't take into account primary colours that are less than 300 pixels in size. Additionally, the other hues are also disregarded. These are the basis of colour perception. Image pixels , are the inputs for this project. Image pixels are processed by specific algorithms in the real-time process. There is no fixed time, no monitoring of the algorithm between frames, and no processing using the specified method.

In this colour detection Python project, we'll create a tool that will allow the user to click on any colour to instantly learn its name. Python language libraries include Pandas and OpenCV are used. Open Source Library for Computer Vision. OpenCV was built with a strong focus on real-time applications and was intended to be computationally efficient. Panda may be a cloud-based platform that provides infrastructure for processing both audio and video. The foundations of computer vision are being used to track the three separate hues Red, Green, and Blue. When the code is executed after successful compilation, a window reroutes the displayed picture whose path is provided as an input. We will thus have a data file for this that provides the name of the colour and its values. Then we will measure the separation between each colour and determine which is the shortest.

Literature Review

The interaction of a body's surface with a light beam, an observer, and an item determines its hue. Based on their physical characteristics, such as their light absorption, reflection, or emission spectra, objects, materials, and light sources are assigned colour categories and physical colour parameters. Different colour systems, such as the RGB colour space and the HSV colour space, can be used to quantify colour properties mathematically. The RGB colour space is being used in this project. An LDR and LED network are used in conjunction to measure the colour values.

This chapter covers the theory of colour sensing, differentiation, and the many components that are employed, and it concludes with a summary that are pertinent to this project.

Scope of the project

Red, green, and blue are the main colours that make up all other colours. Each colour value in a computer is defined within the range of 0 to 255. How many different ways are there to define a colour? The solution is 16,581,375 (256*256*256). A colour may be represented in around 16.5 million distinct ways. We must translate the values of each colour to their corresponding names in our collection. We'll be utilising a dataset that lists the names of the RGB values with the values themselves.

In this assignment, we use Python to design and develop a colour recognizer. This method is often referred to as "Color Detection." To identify the colours in an image, we will build a simple application. The RGB values of the colours will also be returned by the application, which is quite useful. Many web designers and graphic designers will be able to explain how RGB values might be useful. A fantastic project to benefit the people with colour blindness that face problems in recognising colours due to defect in their vision.

Work Contribution

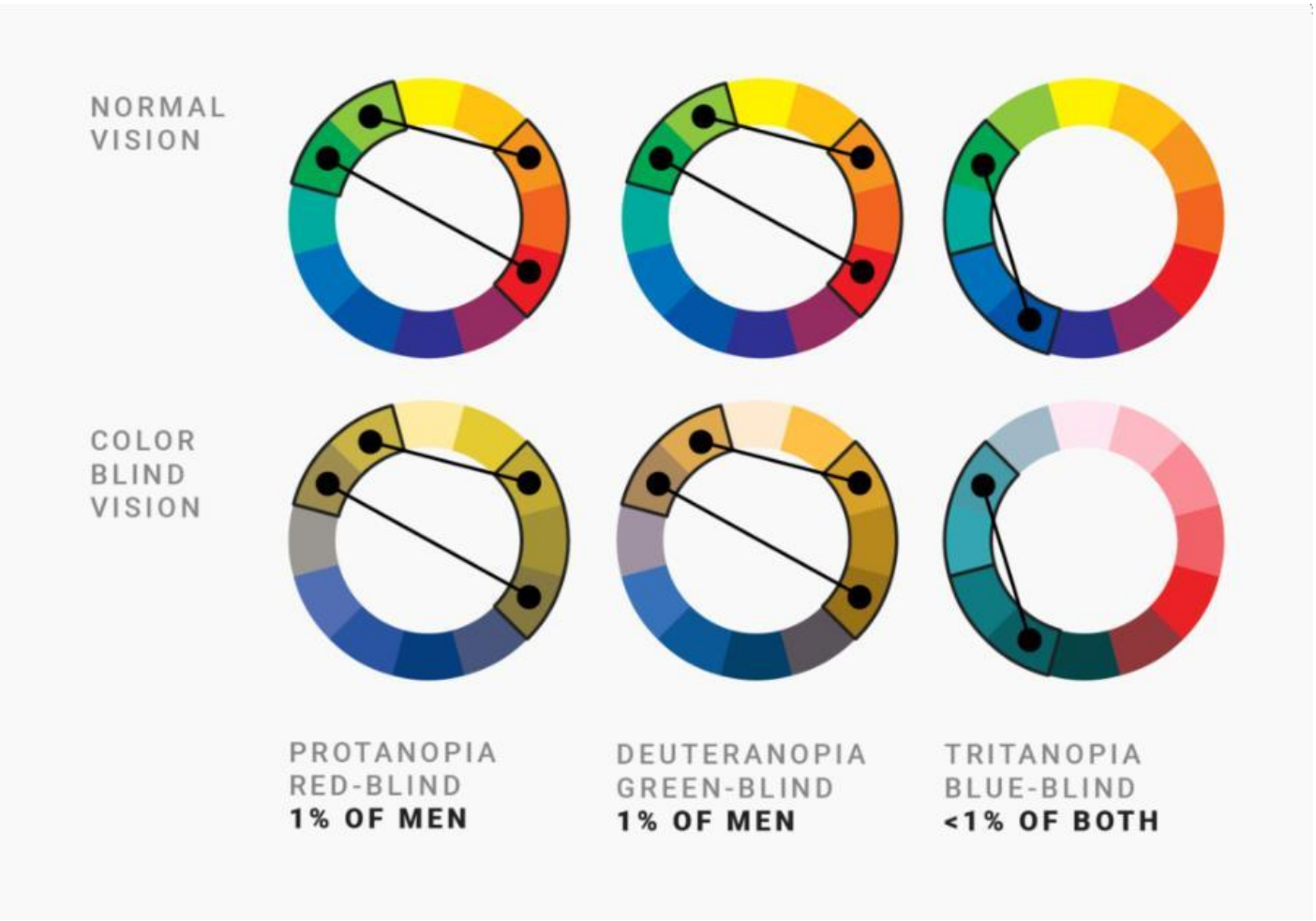
I suggested to use Python libraries like **Pandas.**
Padas is very useful library, from it we use CSV data to for calculating and identifying the distance of colours. Like adding a CSV make very easy to fetch list of colours with name and hexadecimal value.
Moreover I did a lot of coding part, with the help and suggestion of my teammates and learnt a lot from it.
I would love to apply, not only this method, but also my other organizational skills to this job at your company.

For making presentation we distributed the slides amongst us. I was responsible for the topics including Problem statement, Features of the model and the block diagram.

PROJECT : COLOUR DETECTION

Problem Statement

As certain colours resemble one another, it is never easy to distinguish colours with our physical sight. Additionally, colour blindness, sometimes referred to as colour vision deficit, is a sort of ocular visual problem. The patient's everyday life and participation in certain color-related activities have been hampered by their inability to perceive colour in a number of ways. Colorblind people are confined to fewer hobbies in addition to fewer employment opportunities.



Suggested Solution

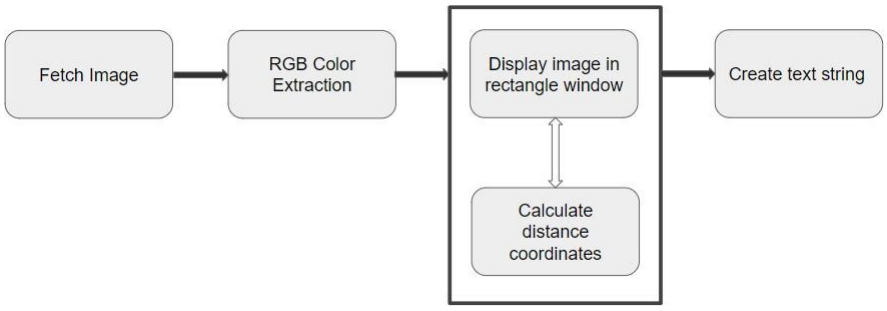
In this project on colour recognition, we have developed a programme using python that will enable users to click on any colour and instantly learn its name. We'll be utilising a dataset that lists the names of the RGB values with the values themselves.
Thus, a data file with the name of the colour and its values will exist for this. The spacing between each colour will then be measured, and the shortest colour will be chosen.

Features and Discription

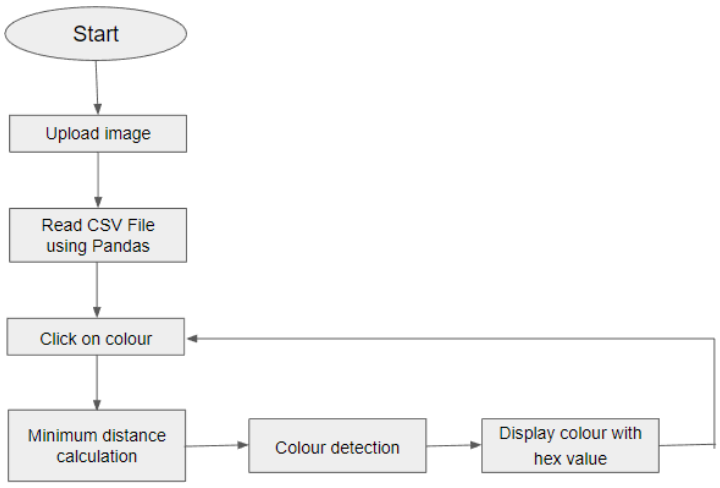
- We are exhibiting the CV database and the number of shades that can be recognised, utilising 865 colour names together with their RGB and hex values in the proposed method.
- The RGB colour values for the picture are automatically shown whenever the pointer touches the image.
- The libraries pandas and OpenCV are used to automatically identify the exact name of the colour.
- This method's ability to differentiate between multiple shades of a single hue is its key selling feature.

In this Python colour detection project, we built a tool that enables the users to click on any shade to find out its name right away. Pandas and OpenCV are utilised as Python language libraries. Open Source Computer Vision Library OpenCV was designed to be computationally effective and with a major emphasis on real world applications. Panda may be a platform that runs in the cloud and offers the necessary infrastructure for processing. The three distinct colours Red, Green, and Blue are being tracked using the principles of computer vision. After successful compilation, a window reroutes the displayed image based on the path entered when the code is run. As a result, we will have a data file that contains the name of the colour and its values. The spacing between each colour is measured to determine which has the smallest distance.

Block diagram

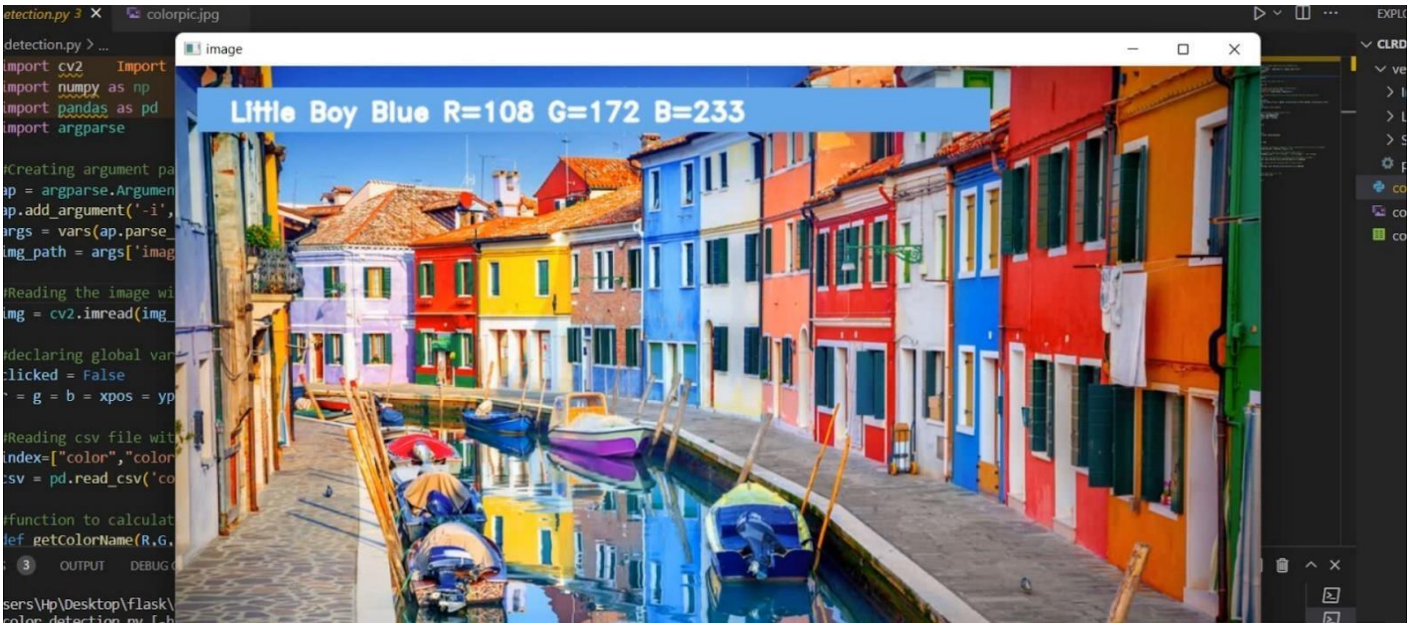


Flow Chart



Result

LINK - https://drive.google.com/file/d/1st1gjlOJSDye5nC1V3jZ68dwrSHp9RzR/view?usp=sharing



CONCLUSION

We learnt about colours in this study field along with all of the research technique, future objectives, and findings. The primary quality of objects is colour. To fully comprehend all that is happening around us, we need to be able to recognise colour. Additionally, colour detection has a wide range of uses in robotics and other fields that improve quality of life.

In this work, we defined how to extract the necessary colour space from an RGB picture. Using the openCV platform, different phases are implemented in this. We showed how to read CSV files with Pandas, as well as how to read actions like double-clicking on a window, and how to use the OpenCV library to manipulate data. This is often used in several sketching and image-editing programmes. This method's ability to differentiate between multiple shades of a single hue is its key selling feature. The identification of edges has a variety of possible uses in the future, such as facial recognition and colour conversion for grayscale images. That can also be put into practise.

Humans can easily identify the colour and select one in this situation. However, a computer cannot readily identify colour. For a computer to readily recognise the colour is a difficult task. That being the case, we choose this project. On this issue, several projects and research articles have been produced. However, we employ various methods for this job. Python language libraries Pandas, and OpenCV are utilised.

INDIRA GANDHI DELHI TECHNICAL UNIVERSITY

RESUME

RINKI RAGHUWANSHI

Bhopal,Madhya Pradesh

+91-8349649673 rinkir.mca21@nitp.ac.in linkedin.com/in/rinki-raghuwanshi-094a971a0 Rinki2301

Leetcode- rinkiraghu2301

StopStalk- Rinki2301

EDUCATION

National Institute of Technology,Patna — **10 2021-07 2023**
Master of Computer Application - ***CGPA - 9.06*** — *Patna, India*

Sri Sathya Sai College,Bhopal — **07 2018 – 08 2021**
B.Sc. Computer Science - ***Percentage - 79%*** — *Bhopal, Madhya Pradesh*

COURSEWORK

Data Structures & Algorithms
Operating Systems
Database Management System (DBMS)
OOPS Concept
Computer Network

INTERNSHIP AND TRAINING

Techwave | Development using python — **06 2022 - 07 2022**

PROJECTS

Snake Game using Python | Using turtle graphics, concepts of OOPs — **07 2022**

Coverter Using Socket Programming
| Covert ASCII to character and character to ASCII using using Socket Programming

TECHNICAL SKILLS

Languages: C, C++, Python, SQL
Developer Tools: VS Code,Code Block, pyCharm, Cisco Packet Tracer, Oracle 11g ,star UML, anaconda
Technologies/Frameworks: GitHub, Turtle Graphics

EXTRA CURRICULAR

- Problem Solving
- Competitive Programming
- Exploring and Learning
- Reading

ACHIVEMETNS CERTIFICATION

•*HackerRank – BasicSQL*
• *HackerRank5 ∗ ProblemSolving, CPP, SQL*

LEADERSHIP EXPERIENCE

•Class Representative
• Under Officer in NCC

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