KNOWLEDGE & TECHNOLOGY

Bangladesh Army University of Engineering & Technology

Department of Computer Science and Engineering

A project on

RGB value detection

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CERTIFICATE

This is to certify that the project entitled "RGB value detection" by "MD. Touhid Iqbal Sagar", ID No.: 18204023, "Mst. Rukhtaj Ara Choitee", ID No.: 18204031, "Nosin Atia", ID No.: 18204063, has been accepted as satisfactory in partial fulfilment of the requirement for the degree of Bachelor of Science in Computer Science and Engineering on October, 2022.

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DECLARATION

I thereby declare that our project entitled “RGB value detection” is the result of our work. We also ensure that it does not previously submitted or published elsewhere for the award of any degree or diploma.

The work has been accepted for the degree of Bachelor of Science in Computer Science and Engineering at Bangladesh Army University of Engineering & Technology (BAUET).

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ABSTRACT

It's a type of program that allows us to detect the colour of an image. This project allows to detect more than 850 colours. We can detect some basic colours like red, green, blue, yellow etc without any colour chart. So, we have decided to build a project that detect colours more accurately with its RGB value. The project gives accurate result then detect it manually and less time consuming. We have used very popular programming language python to build this project called “RGB value detection”.

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Chapter 1

INTRODUCTION

1.1 Introduction

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built-in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse. The Python interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed. [1]

Pure Python projects are intended for Python programming. A project helps you organize your source code, tests, libraries that you use, and your personal settings in a single unit. In case, you don't need a project, you can edit your file in the LightEdit mode. [2]

1.2 Objectives

Each parameter (red, green, and blue) defines the intensity of the color with a value between 0 and 255. This means that there are 256 x 256 x 256 = 16777216 possible colors. For example, RGB (255, 0, 0) is displayed as red, because red is set to its highest value (255), and the other two (green and blue) are set to 0. Another example, RGB (0, 255, 0) is displayed as green, because green is set to its highest value (255), and the other two (red and blue) are set to 0. To display black, set all color parameters to 0, like this: RGB (0, 0, 0). To display white, set all color parameters to 255, like this: RGB (255, 255, 255).

1.3 Advantages

a. Time saving.
b. User friendly.
c. Dynamic.
d. Accuracy.

1.4 Disadvantages

a. Python environment required.
b. Path of the image have to put in program manually.

Chapter 2

BACKGROUND STUDY

2.1 Introduction

The first step is obviously the most basic one. If you are reading this article you might already have a basic idea in mind. But is that enough? Your idea about the python needs to be highly specific. It should aim to solve a specific problem or perform a specific set of functions. Using python programming language, we are going to build a project for property detecting colors from an input image.

Our goal is to have something which is going to be a user-friendly project that will help user to detect colors. He doesn't have to check the color chart manually.

2.2 Existing system:

There are some existing systems where we can only detect the color of the image. But in our project, we can detect color as well as RGB value which makes us different from others.

2.3 Conclusion:

Our proposed project is “RGB value detection” - A python-based project. It’s a new generation of python project where we want to introduce it with the world. Though some color detection projects exist, we have implemented RGB value detection for the first time in python project, able to see more than 850 color names with its RGB value.

Chapter 3

PROPOSED MODEL

3.1 Introduction

Our proposed model is incremental model to create a python project. The development process based on the Incremental model is split into several iterations ("Lego-style" modular software design is required!).

New software modules are added in each iteration with no or little change in earlier added

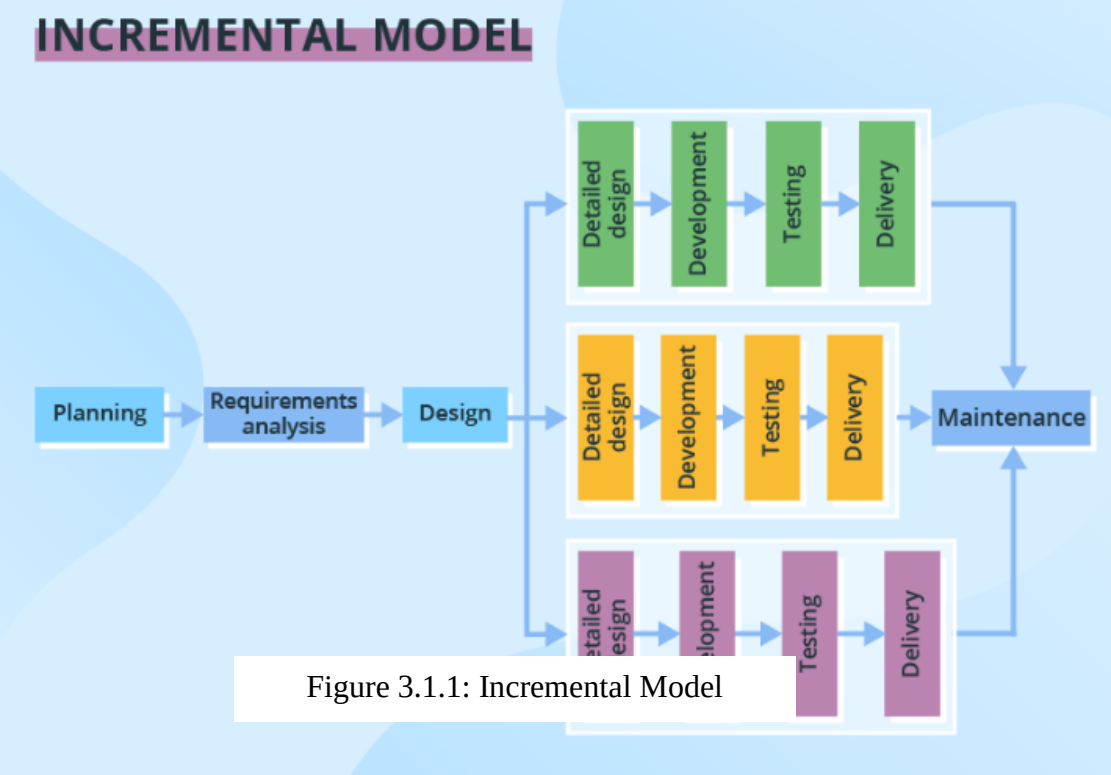

Figure 3.1.1: Incremental Model

modules. The development process can go either sequentially or in parallel. Parallel development adds to the speed of delivery, while many repeated cycles of sequential development can make the project long and costly. [3]

3.2 Flow-chart

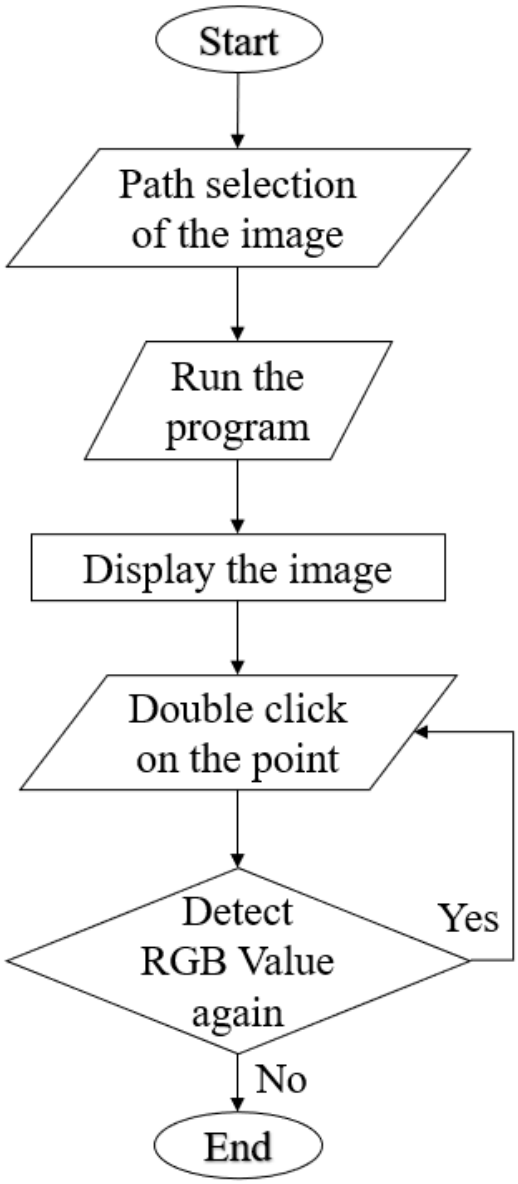

Figure 3.2.1: Flowchart of RGB value detection

This is the flowchart of our python project. At first, we have to select the path or location of the image from the computer. After the path selection of the image, we have to run the project. After running the project, selected image will be displayed on the screen with a new window. Then we have to select the point where we have to detect the colour by clicking on that point twice. The result will be displayed in the top left corner of the window. If we want to detect more colours he can click twice at that point. After completing the detection, he can exit from the project.

3.3 Use-case Diagram:

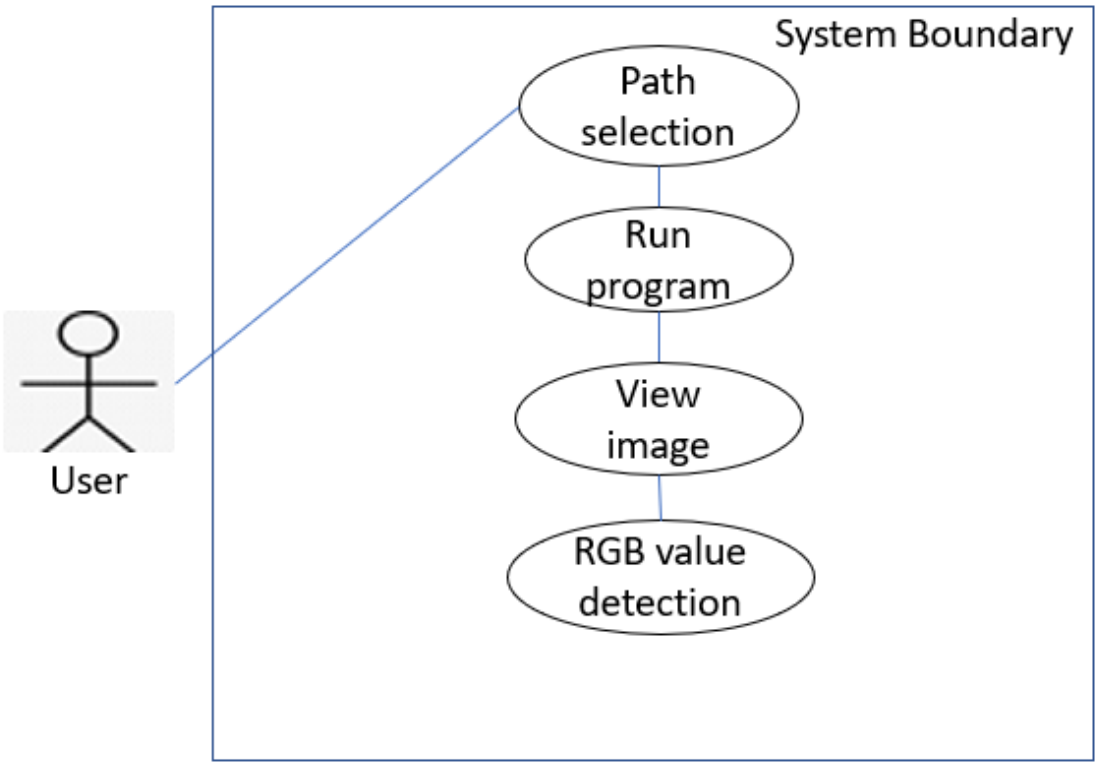

Figure 3.3.1: Use-case Diagram of RGB value detection

Here, we can see we have only one actor that is user. He can select the path of the image and run the project. After running the project, the user can click on the point where he wants to see the RGB value and colour name.

3.4 Proposed Algorithm:

Fig 3.4.1: Representing K-means algorithm

K-Means Clustering is an Unsupervised machine Learning algorithm, which groups the unlabeled dataset into different clusters. Here K defines the number of pre-defined clusters that need to be created in the process, as if K=2, there will be two clusters, and for K=3, there will be three clusters, and so on. [4]

Here, we can see the color scale of an image. In this image there is a large portion of black color. Then Paste, Sky blue and white color is available. Which is visible in the pie chart.

3.5 Proposed Model:

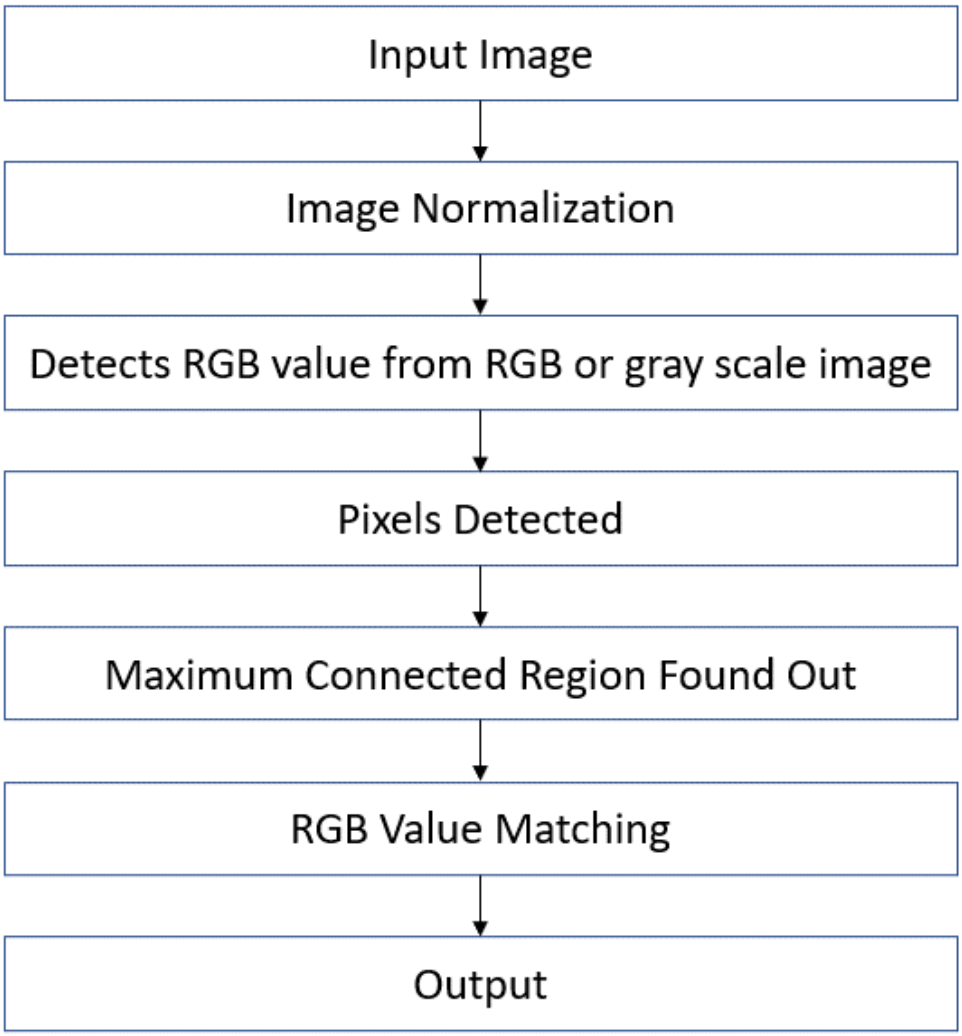

Fig 3.5.1: Proposed Model

At first, we need an image as input. Then we have to do image normalization for changing the range of pixels intensity value. It detects the RGB value from both the RGB and Gray scale images. Then the pixels are detected. After that maximum connected region found out and we found the red, green, blue regions and hence, we get our desired output.

Chapter 4

IMPLEMENTATION

4.1 Introduction

The implementation phase involves putting the project plan into action. It's here that the project manager will coordinate and direct project resources to meet the objectives of the project plan. As the project unfolds, it's the project manager's job to direct and manage each activity, every step of the way. Our project is implemented as the requirements. All the options proposed in the design is implemented here.

4.2 Visual Representation of Our System

We have implemented our project in python and here is the visual representation of our project below:

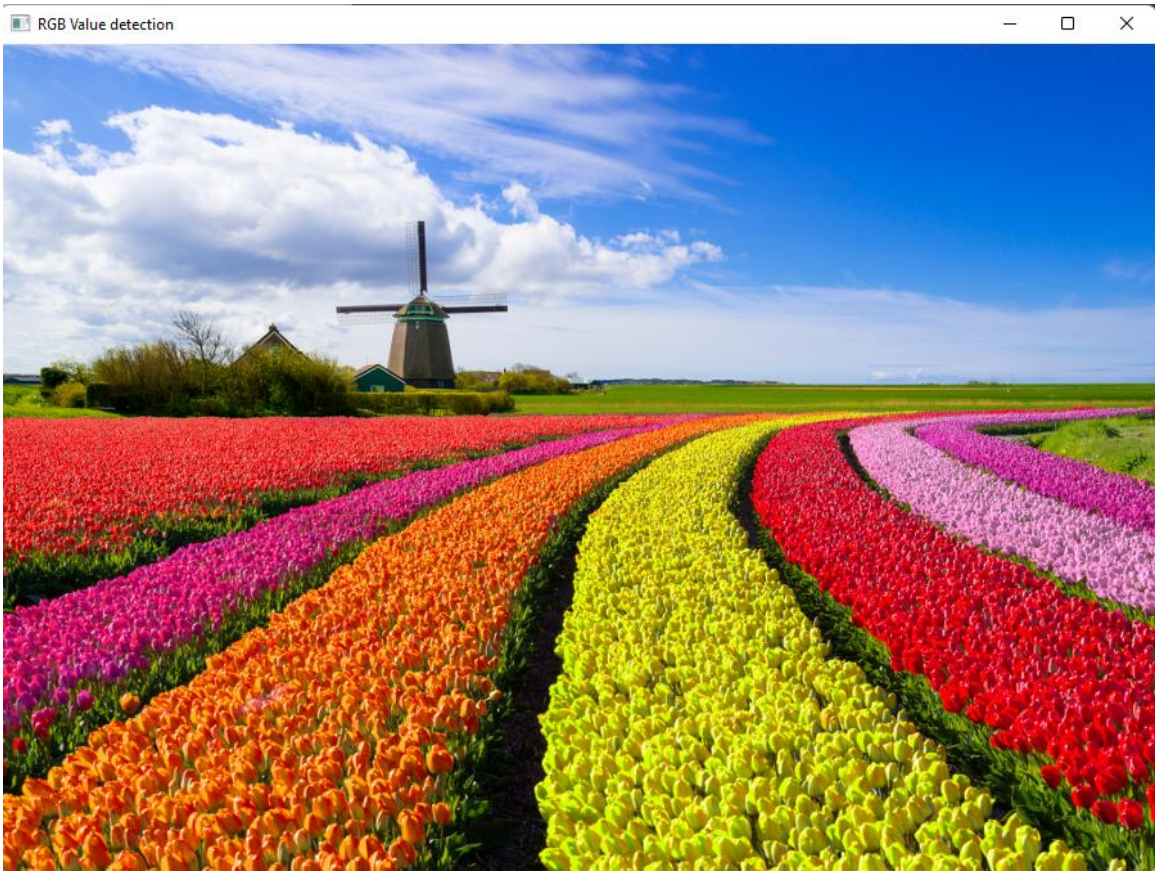

Figure 4.1.1: Image output window

This is the image output window page of our project. After running the project we will see this window.

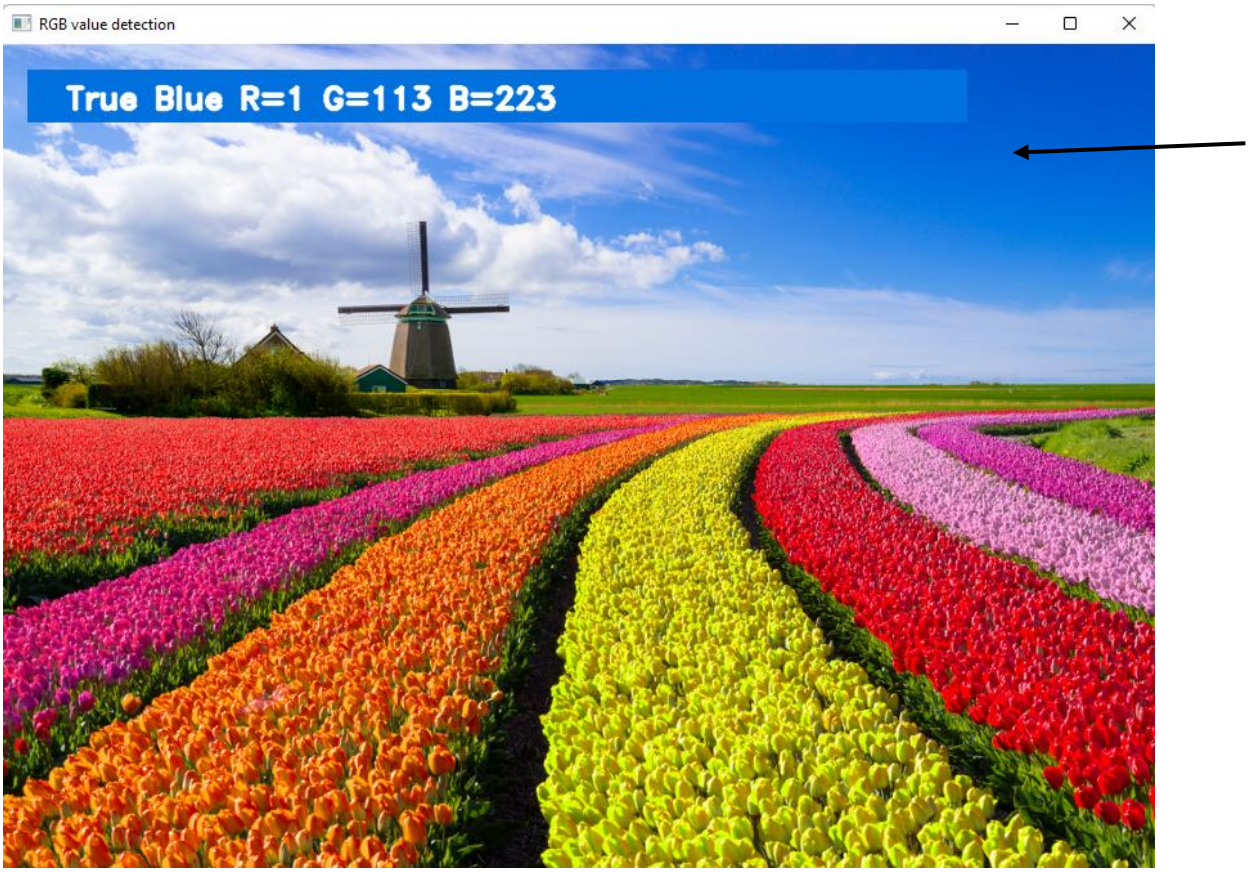

Figure 4.1.2: Detecting RGB value 1

Here we have clicked on the sky and it shows us the colour name “true blue” and the value of the Red=1, Green=113 and blue=223.

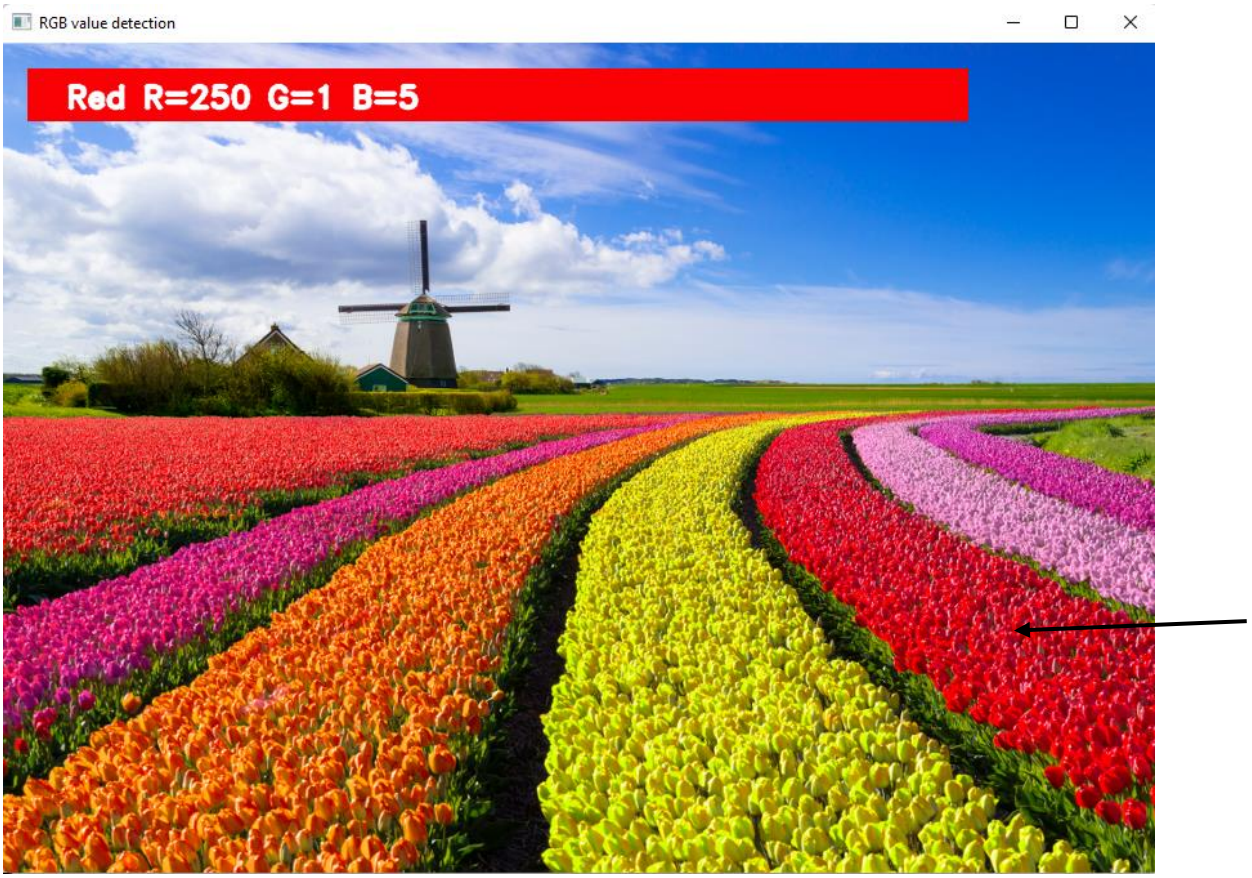

Figure 4.1.3: Detecting RGB value 2

Here we have clicked on the red flower and it shows us the colour name “red” and the value of the Red=250, Green=1 and blue=5.

Figure 4.1.4: Detecting RGB value 3

Here we have clicked on the sky and it shows us the colour name “Dark cerulean” and the value of the Red=30, Green=69 and blue=128.

Figure 4.1.5: Detecting RGB value 4

Here we have clicked on the orange part and it shows us the colour name “Persian orange” and the value of the Red=199, Green=142 and blue=89.

Figure 4.1.6: Detecting RGB value with a Gray scale image

This is a Gray scale image. Here we have clicked on the Gray part and it shows us the colour name “Taupe Gray” and the value of the Red=138, Green=139 and blue= 141.

Chapter 5

CONCLUSION & COMPARISON

5.1 Introduction

This chapter describes the future scope and extensions for the project. There is still a huge scope of implementing something new and more to the project which can make it to the level of a commercial product. This section also concludes stating the advantages and applications of this RGB value detection project.

5.2 Conclusion

This project “RGB value detection” is a mini project using python programming language. Development of a python project has been developed in this paper. The system can provide an accurate detection of colour with its accurate RGB value. Here user-friendly interfaces have also been adopted so that user can easily use our project without any complexity.

We have existing systems that can detect only the colour of the image but we can also detect the RGB value as well as colour name in our project that differ us from others. In this mini project we have implemented RGB detection from an image. Our future goal will be to implement a project where we can take a video as input and detect the colour with its RGB value.

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