COLOUR RECOGNITION

Project report submitted in the partial fulfillment of the requirements for the Diploma in Computer Science & Technology
In
Technique Polytechnic Institute
By

REBHU ROY
REGISTRATION NUMBER : D121358439

Under the Guidance of
Mr. SHIBDAS BHATTACHARYA
Lecturer in Department of Computer Science & Technology
Technique polytechnic Institute
Panchrokhi, Sugandhya
Hooghly, Pin-712102

CERTIFICATE

This is hereby certified that the project report titled **Colour Recognition** being submitted by **Rebhu Roy** as part of course Diploma,is a record of bonafied work carried out by him under my guidance and supervision from **July, 2014** to **April, 2015** at the **Department Of Computer Science And Technology** ,at **Technique Polytechnic Institute** approved by **AICTE** and affiliated by **WBSCTE.**

……..

Lect. Shibdas Bhattacharya
Department of Computer Science and Technology
Technique Polytechnic Institute, Hooghly-700032

Forwarded By

……

Lect.Prasun Kumar Mitra
HOD, Department of Computer Science and Technology
Technique Polytechnic Institute, Hooghly-700032

Date:**……**

CERTIFICATE OF APPROVAL

The foregoing project, entitled "**Colour Recognition**" is hereby approved as a creditable study of an engineering subject carried out and presented in a manner satisfactory to warrant its acceptance as prerequisite to the degree for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or accept every statement made,opinion expressed or conclusion drawn therein, but approve this thesis only for the purpose for which it has been submitted.

…… ……

Signature of the Examiner Signature of the Supervisor

ACKNOWLEDGEMENT

I am highly greatful to **Mr.P.K.Mitra**, H.O.D CST, Technique Polytechnic Institute, Panchrokhi, Sugandha, Hooghly for providing this opportunity to carry out the major project at **Image Processing and Colour Recognition.**

I would like to express our gratitude to other faculty members of Computer Science & Technology department of Technique Polytechnic Institute, Panchrokhi, Sugandha, Hooghly for providing academic input, Guidance & encouragement throughout this period.The other would like to express a deep sense of gratitude and thanks to everyone.

The help renderd by **Mr.Shibdas Bhattacharya,** project guide,and my group members **Abir Das, Pritam Munshi, Debibrata bej** for experimentation is greatly acknowledged.

Technique Polytechinque Institute

April, 2015

CONTENTS

LIST OF FIGURES

CHAPTER 2

ABSTRACT

I have developed a near real-time computer system that can recognize the colour by comparing characteristics of the colour to those of known objects. The computational approach taken in this system is motivated by the practical requirements of near real-time performance and accuracy. Our approach treats the colour recognition problem as an intrinsically two-dimentional(2-D) recognization problem rather than requiring recovery of three-dimentional geometry; taking advantage of the fact that colours are normally upright and thus may be described by a small set of 2-D characteristic views. The system functions by projecting colour images onto a feature space that span the significant variation among known colour images. The significant features known as “eigencolours” because they are the eigenvectors(principal components) of the set of colours; they do not necessarily correspond to features such as eyes, ears, nose. The projection operation characterizes an individual colour by a weighted sum of the eigencolours features and so to recognize a particular colour it is necessary only to compare these weights to those of known individuals. Some particular advantages of our approach are that it provides for the ability to learn and later recognize new colours in an unsupervised manner, and that it is easy to implement using a neural network architecture.

Through our project I can try to recognise the combination of primary colours.It means when I will move the mouse pointer on the particular picture then it will show the colour(Primary colours) combination and also the percentage of primary colours of the particular place.

CHAPTER 3

INTRODUCTION

Before I begin,let's take a minute to define the term colour recognition. Colour recognition can be defined as "the ability to identify and name basic colours." For preschool children, this skill is normally focused on such colours as red, orange, yellow, green, blue, purple, brown, and black. Colour recognition,useually abbreviated to detection of an image and then produce percentage of the RGB format of that particular image either be in a single point or more than one point,may be it is an no of point selection.Though academic resarch in the field continuous the focous on colour recognition has shifted to implementation of proven techniques.

Colour recognition can actually be broken down into separate skills – matching, identifying, and naming. When matching, a child can find the matching colour when shown an example. For instance, Michael's teacher holds up a piece of red construction paper and asks, "Michael, can you find another piece of paper that is the same colour?" This is the first step in colour recognition.

The child perceives the differences between the colours.

I dentifying is the next step. Identifying focuses on the ability to identify a colour when named. For instance, Sherry, a three year old, is drawing with crayons. Her teacher asks, "Sherry, can you show me the red crayon?" Sherry points to the red crayon. This is the second step in colour recognition.

The final step is naming. In this step the child can name the colour when asked. For instance, Alonzo, a four year old, is playing with table blocks. His teacher holds up one of the blocks and asks, "Alonzo, what colour is this block?" Alonzo replies, "Blue." In this case Alonzo is able to name the colour presented to him. This is a more difficult skill than either matching or identifying. Alonzo must know the names of the colours in order to be able to name them for his teacher. During his thought processes, Alonzo must first mentally note

the colour of the block and then associate the colour with its name. Itry to recognise the combination of primary colourRGB model (RED GREEN BLUE).According to our project when iclick on a particular posision of an image then it will show us the combination of RGB (RED GREEN BLUE)colours with their percentage. For some application areas including colour recognition show promice in achivenig human like performance over more tradditional.

CHAPTER 4

OBJECTIVE

The objective of our project to obtain a comprehensive image recognition techniques. This algorithm is simple as well as powerful. The objective of this algorithm is to read an image. Then analyze the Red, Green, Blue colour quantity of a particular pixel point and calculate the percentage of their quantity.

CHAPTER 5

PURPOSE OF THE PROJECT

To explore the meaning and importance of colour recognition as it relates to human life. There are many different ways to integrate the concept of colour recognition into our daily life. The following are some common daily routine's topics or themes that contain many opportunities for colour recognition. See how many you are currently covering in our curriculum!

As an human it is up to you to observe each human on a continuing basis to note his/her understanding of colour recognition. Often, human will be able to name a few colours but not all of them. Through your observations you should note the colours human can match, identify, and name. Remember, matching, identifying, and naming are three separate skills. The member in your family may have different levels of knowledge in each of these areas. If you take a look at several specific examples of colour recognition to help clarify this concept.

CHAPTER 6

MOTIVATION OF THE PROJECT

In our present world image processing performs a major role because this world became more colourful day by day. As our daily life style increase, demand on various colour combination also increase. By modify anything from its previous one ican upgrade ourselves.

To modify anything detection of the particular thing is most important.Here image processing takes part and in case of image processing the most important is recognizing the colour of a particular substance. To make a new style change the combination of colour is also a important part.

It mostly help the people who are Artist, Designer etc. Detection or Recognize is important for them. It is not possible to find out the combination of different colour from any substance or image manually. So if any system tell them how many combination of colour makes a particular colour and in which quantity will help them a lot to increase their efficiency.

For all this thing iare motivated to make a system which will find out the percentage of different colour of one or more pixel point of a selected picture.

For this it will help to modify the same thing using the previous one.

CHAPTER 7

REQUIRED ACCESSORIES

7.1 HARDWARE USED

PROCESSOR	i3, 3.00GHZ
HARD DISK	160GB
RAM	2GB
GRAPHICS CARD	512MB
MONITOR	17 inch
KEYBOARD & MOUSE	LOGITECH

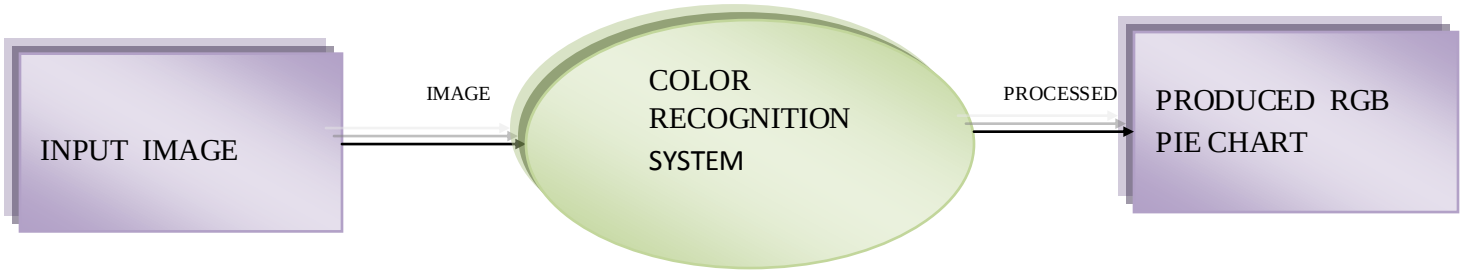
7.2 SOFTWARE USED

OPERATING SYSTEM	WINDOWS – XP
SOFTWARE	MATLAB 2012b

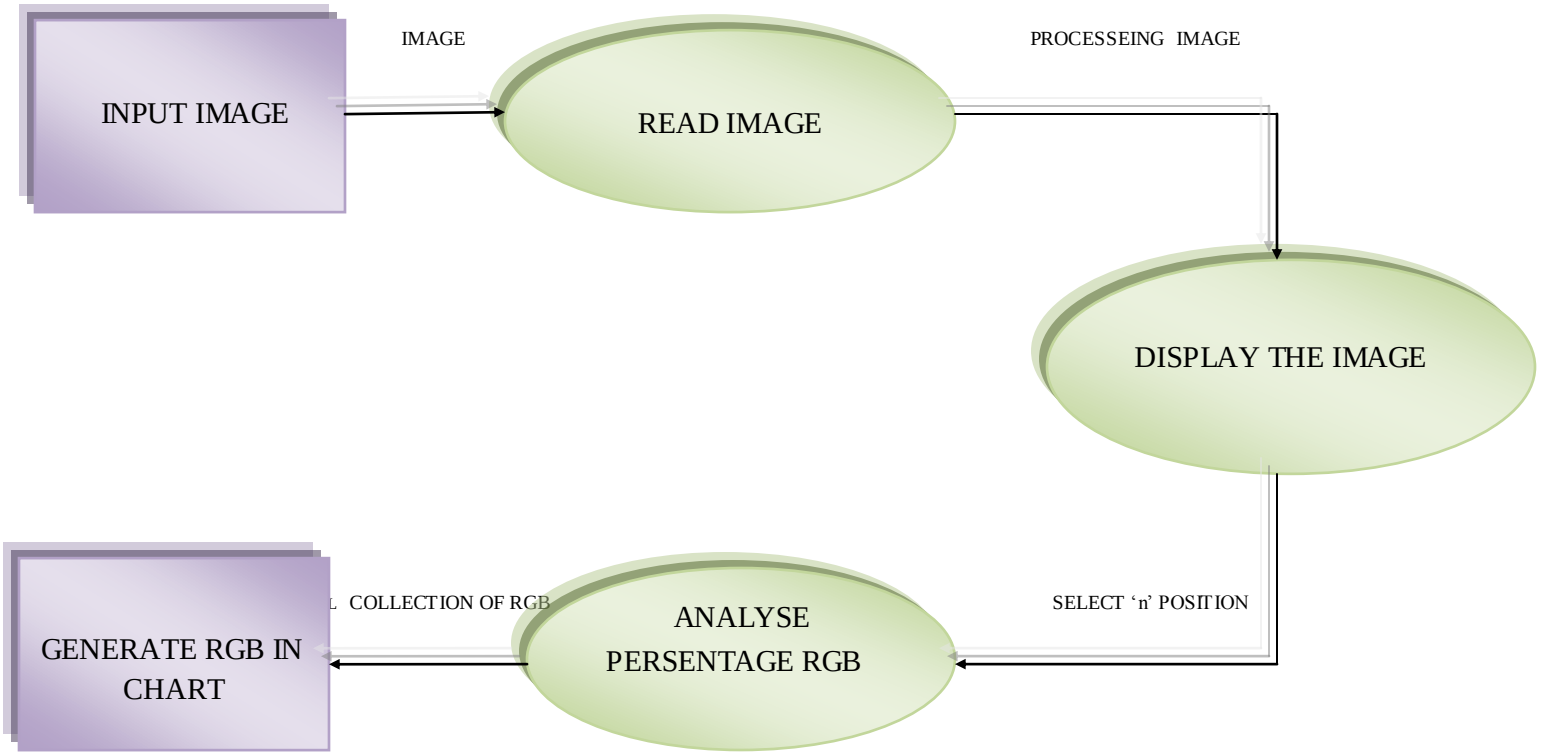
CHAPTER 8

DATA FLOW DIAGRAM(DFD)

8.1 LEVEL 0



8.2 LEVEL 1


INPUT IMAGE
IMAGE
READ IMAGE
PROCESSEING IMAGE
DISPLAY THE IMAGE
SELECT 'n' POSITION
ANALYSE PERSENTAGE RGB
L COLLECTION OF RGB
GENERATE RGB IN CHART

CHAPTER 9

CODING

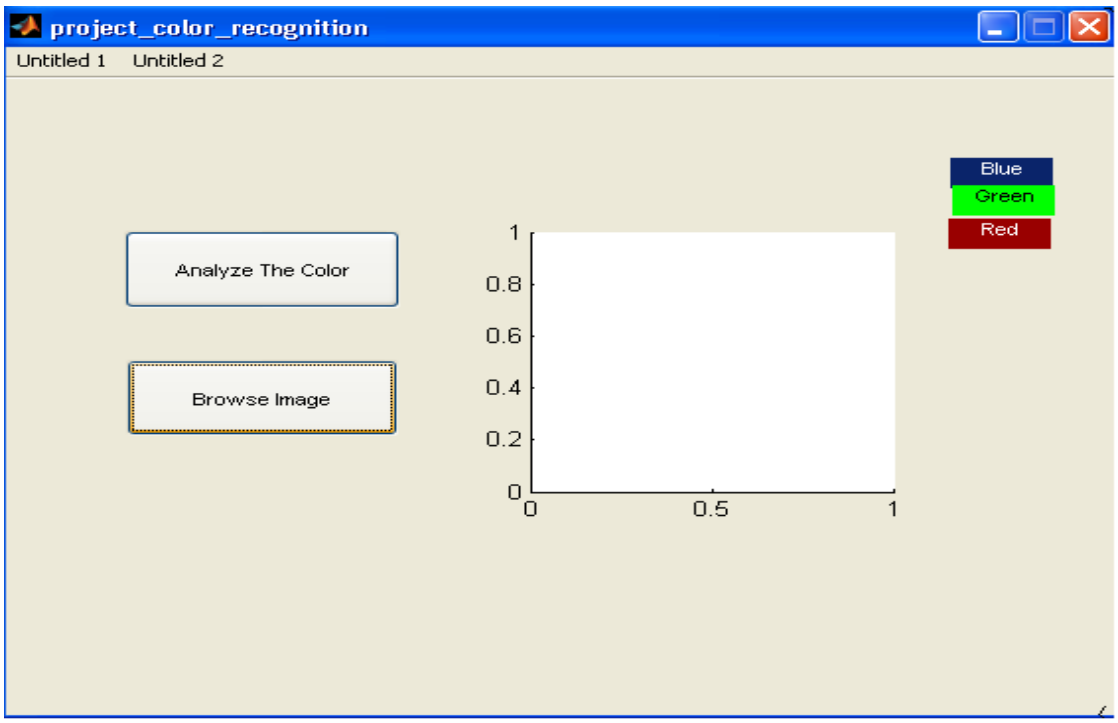


figure 1

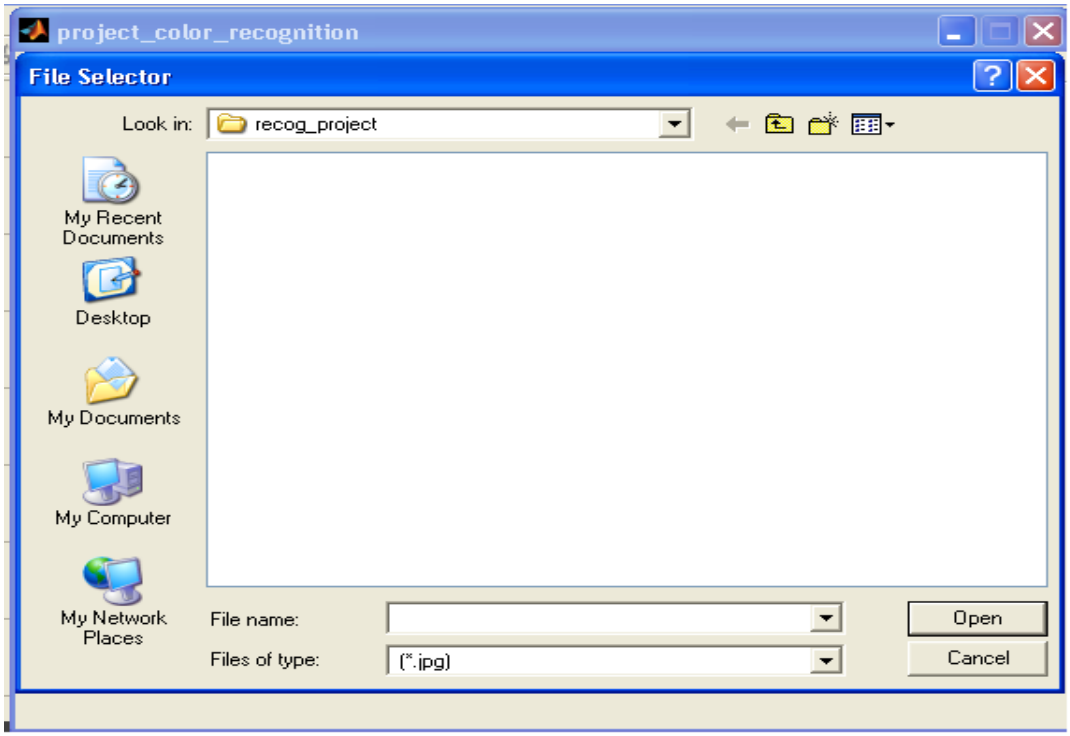


figure 2

9.1 Creating GUI interface :

Analysis : Ihave get the 1st figure where icreated the GUI(graphical user interface).

The GUI looks like as figure 1.when ihave write the command "guide" then it will appear a window which contain some references from there ihave typed blank user interface then next click it will created. Then ihave create it manually using drag and drop interface in matlab. Where ihave used buttons and axes. It Executes just before project_ colour_recognition is made visible.

function pushbutton_ Callback(hObject, eventdata, handles) is executed when iclick that particular button. The purpose of push button is to perform a job when a event is occurred .

Code :

```
function varargout = project_color_recognition(varargin)

gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
'gui_Singleton',  gui_Singleton, ...
'gui_OpeningFcn', @project_color_recognition_OpeningFcn, ..
'gui_OutputFcn',  @project_color_recognition_OutputFcn, ..
'gui_LayoutFcn',  [] , ...
 'gui_Callback',   []);
if  nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end
if nargout

   [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end
```

```
function
project_color_recognition_OpeningFcn(hObject,eventdata,handles,
varargin)
handles.output = hObject;
guidata(hObject, handles);
function varargout = project_color_recognition_OutputFcn(hObject,
eventdata, handles)
varargout{1} = handles.output;
```

9.2 Browsing image :

Analysis: Ihave got the 2nd figure after creation of the GUI(graphical user interface).
The "BROWSE IMAGE" button is used to import a picture from a particular picture Location.As shown in the figure 2.A user can select a picture of any specific location by only clicking the browse button.

Code :

```
function pushbutton2_Callback(hObject, eventdata, handles)
 [fn pn]=uigetfile({'*.jpg';'*.bmp'},'File Selector');
image = strcat(pn,fn);
axes(handles.axes1);
 imshow(image);
```

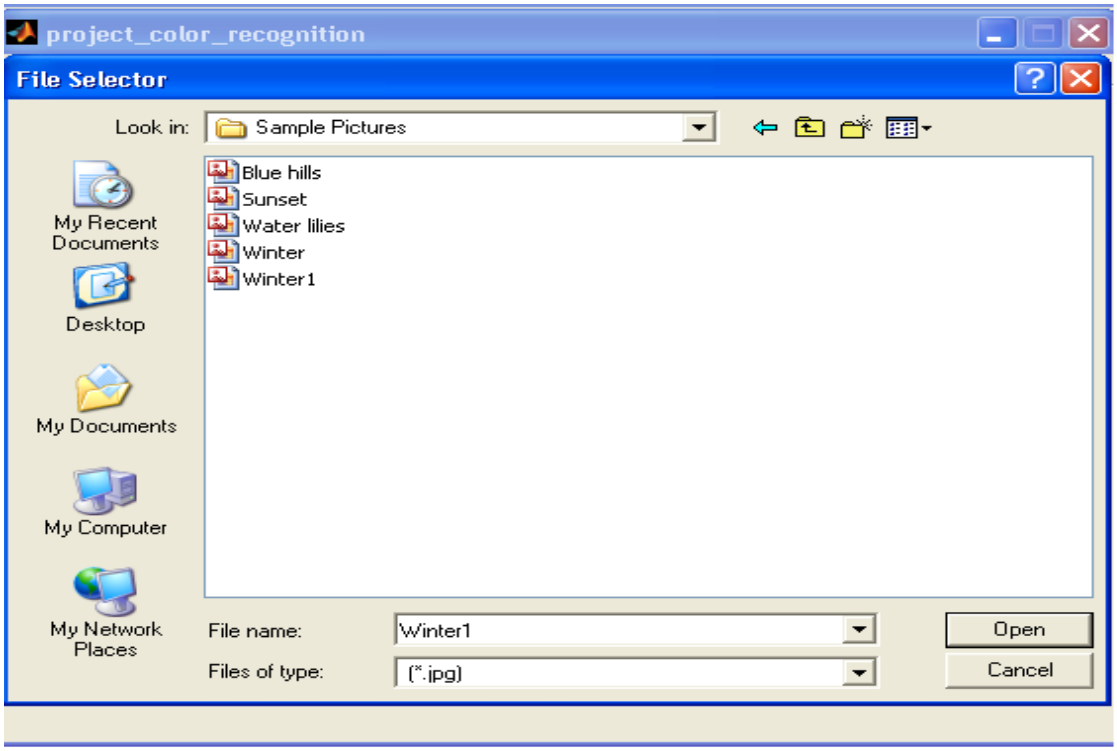


figure 3

figure 4

9.3 Importing image :

Analysis : Ihave get the 3rd figure after clicking the BROWSE BUTTON in which i can select a particular picture to analyse the colour, which may be in .jpg extention or may be in .bmp extention .After the selection of picture i have to click the "open" button to import the particular picture as shown in figure 3.

9.4 Analysing percentage of RGB :

Analysis : Ihave get the 4th figure after choosing an image from the BROWSE option, as shown figure 4.Now ican see the image in a perticular box and ican analyse the colour of the particular picture by selecting one or more pixel point and then by clicking "Analyze The Colour " button.Imay know the colour combination of one point or several points at a time.It's upto the user.After import the picture if the user select a point and then click on "Analyse The Colour" button then it will give only the percentage of colour quantity of RGB of one point.But if the user select several points on the particular picture and then click on "Analyse The Colour" button then it will show the percentage of average colour quantity of RGB of those points. In figure 4 cross symbol is showing the selected point.
Except this user can rectify the no of clicking point on the picture by using the "Backspace" button.

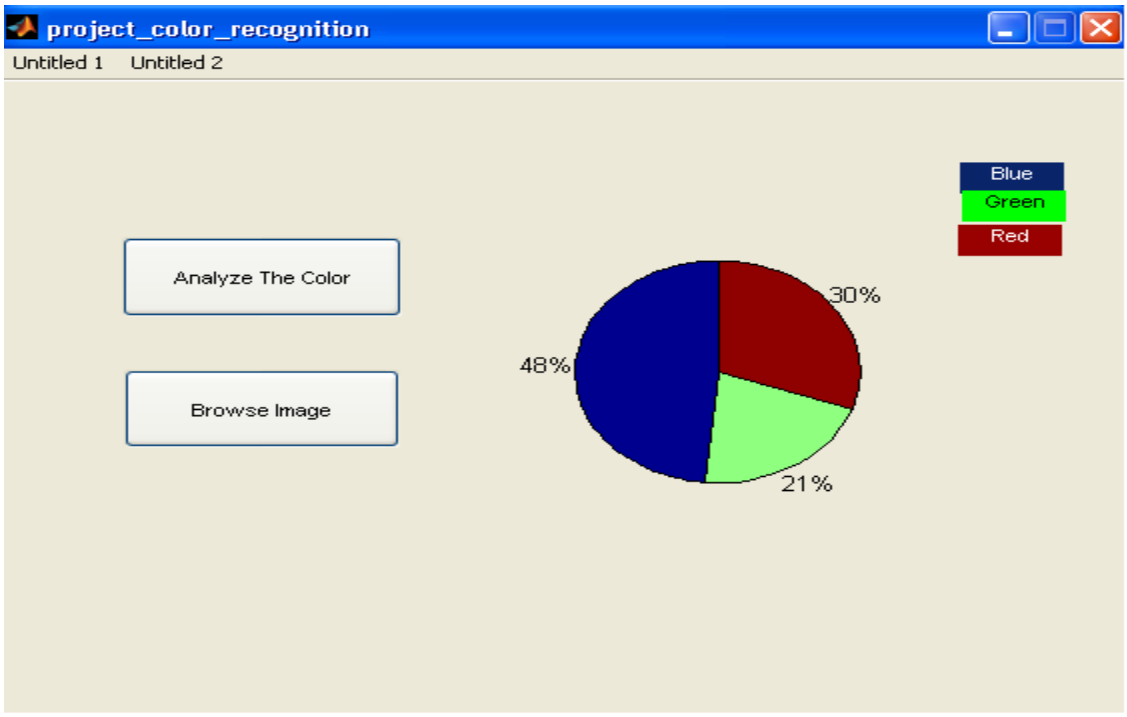

project_color_recognition
Untitled 1
Untitled 2
Analyze The Color
Browse Image
Blue
Green
Red
30%
48%
21%

figure 5

9.5 Showing percentage of RGB :

Analysis : The figure 5 is showing the percentage of RBG quantity of selected point.After clicking the "analyse the colour" button a pie chart will appear and will show the percentage of Red, Green, Blue quantity of the selected points.It will come at the place of the picture.

Code :

```
val = impixel;
 pie(val(1,:));

 figure(gcf);
 axes(handles.axes1);
```

CHAPTER 10

FURTHER WORK

In this whole session I have already known what is RGB and how can idetect the RGB in user chosen picture. That's a greater motive when I start the project the theory was driven in our mind that how to detect a colour in a '.jpg' or '.bmp' image. In a given image the system will detect the quantity of RED GREEN and BLUE. In a single click it will recognize the measurement of that particular point if more than one click is given it will calculate the average percentage of the RGB. So it will help us to modify anything using the previous one by changing the combination of colour.

In this system user can get the average percentage of RGB and then he/she can change the average quantity of RGB to modify the picture which will make some new colours which will may more attractive than previous. But to make a new combination and picture modification he/she need another Editor. Our system will not help him/her now.

But it is our future thinking that, our system will be able to recognize a selected image. And will give the RGB percentage, where the user select(mentioned before). Then user will be able to change the quantity of colour and can modify the same image with the new combination. As the various image Editor does. And also be able to modify one picture to another picture having same shape.

For example , A user want to modify his/her own picture. He/she select his previously stored picture from a storage device. Now he/she select various area of the picture. So, he/she will get the same colour combination of that particular area to a another selected picture having same architecture.Or, he/she can change the previous combination of colour to a newer one.

An example is given below in the figure 6 and figure 7. The two pictures having same shape and size. The area of the figure 6 having red marked was recognized and the RGB of that area was put into the area having red marked in figure 7.

figure 6

figure 7

CHAPTER 11

BIBLIOGRAPHY

1. Digital image processing using MATLAB 2nd Edition by Rafael.C.Gonzalez, Richard.E.Woods, Steven.L.Eddins.
2. http://www.matlab.in.
3. http://www.imageprocessingplace.com/root_files_V3/students/students.htm