

Color Blind Aid: Make Color-Blinded Life Easier

Asty Nabilah Izzaturrahmah
Department of Information System
Hanyang University
Seoul, South Korea
astynabilah@hanyang.ac.kr

Ni Putu Winda Ardiyanti
Department of Information System
Hanyang University
Seoul, South Korea
windardiyanti99@gmail.com

Abstract—In this project, a trial is an attempt to make aid for color blinded people so they can detect and classify colors. Color spaces that will be used in this program is RGB (Red Green Blue). The image processing technique is used for identifying the colors in an image. The program has features such as Find A Color, Specify This Color, Articles About Color Blind, Color Blind Test, Mini Quizzes, Find Nearest Eye Doctor, Clothing Guide, and Color Harmonies.

Keywords—color, colorblind, image processing, RGB color space

I. INTRODUCTION

Color is one of the most important things in human's life. It defines the characteristics of an image. Unfortunately, not all people can see the difference between these colors. The purpose of this project is to develop an application that can solve the color blindness problem, and make colour blinded people can easily see the difference in the colors.

The oxford dictionary defined color as “The property possessed by an object of producing different sensations on the eye as a result of the way it reflects or emits light”[1].

A range of colors can be created by the primary colors of pigment and these colors then define a specific color space. Color space, also known as the color model (or color system), is an abstract mathematical model which simply describes the range of colors as tuples of numbers, typically as 3 or 4 values or color components[2]. There are some color spaces, one of them that will be used in this program is RGB (Red Green Blue).

An RGB image is a colorful image consisting of fixed values of color contents for each pixel. These color contents have different values ranging from 0 to 255.[3]

Colourblind, also known as color vision deficiency is a decreased ability to see the differences of color. Color blindness may make someone's activity more difficult because color blinded people more difficult to distinguish certain colors such as blue and yellow or red and green.[4]

II. FEATURES DESCRIPTION

The features of this app are described below.

A. Find A Color

This feature allows user to upload an image and the application will find the color that the user desires.

B. Specify This Color

This feature allows user to upload an image and the application will tell the user the color in the image.

C. Articles About Color Blind

This feature allows user to find the latest articles about color blinded in daily life.

D. Color Blind Test

This feature allows users to take a test to tell if they have colorblind or not. Users can also know what type of colorblind that they have.

E. Mini Quizzes

The feature is made to know how much user's knowledge about colorblind. Quiz questions are about facts about colorblind. There will be only a few of the questions and the quizzes only take less than 5 minutes.

F. Find Nearest Eye Doctor

The features helps user to find nearest eye doctor to do some examination.

G. Clothing Guide

This feature helps people with color blind to choose clothing based on their colors. This feature will helps color blinded because they can't distinguish some of color so they wear a set outfit that doesn't match.

H. Color Harmonies

This feature helps users to find the tonal color to help them in designing.

III. HOW THE MACHINE WORKS

First, the user selects the feature, if they select feature to specify this color the user will input the image. After that, the image will be processed. An image consists of a lot of pixels (i.e. a physical point in a raster image, or the smallest addressable element in an all points addressable display device[5]). Each pixel corresponds to a code. After the analyzation of these codes, these codes can be used for the definition of colors and these defined colors are used to recognize colors in the picture.

If the user chooses the feature 'Find A Color', the program will tell which part of the image contains desired color and if user choose 'Specify This Color' then the output will be the color of the picture.

If the user chooses the feature article about color blinded the program will show many articles that related to the color blind, the user just has to select their articles that they want to read, and the user also can search their article based on the title of the article they want to read.

If the user chooses the feature 'Color Blind Test' the program will display the several tests for the user to take. and after the test is ended, the program will display the result of the test, either the user has colorblind or not, and if so, the program will display the type of colorblind.

Mini quizzes features will show multiple-choice questions. The users select one answer and after it, the app will immediately show the right answer to the current question

Users can also get helped to find the nearest doctor to get some examination. Just one click away and the app will redirect users to the map.

When users choose the clothing guide feature, the program will help them to find matching color of the clothing that users upload as a picture. The program will display several choices of the color outfit that the user can wear, and the user will pick one of them.

Color harmonies feature's way of work is not quite different with clothing guide. The difference is, color harmonies only shows tonal color while the clothing guide shows not only tonal colors but also main colors and some non-tonal color that still match with it.

REFERENCES

- [1] <https://www.lexico.com/en/definition/colour>
- [2] <http://www.arcsoft.com/topics/photostudio-darkroom/what-is-color-space.html>
- [3] Arshi prabhakar, Neetiand Rakhi Devi.2017. "Different Color Detection in an RGB Image", International Journal of Development Research, 7,(08).
- [4] <https://www.allaboutvision.com/conditions/colordeficiency.htm>
- [5] Rudolf F. Graf (1999). Modern Dictionary of Electronics. Oxford: Newnes. p. 569.