1. Project Statement

Introduction

"Name That Color" is an android base application for color blind people. To identify the real-world colors in the surrounding with the help of the device camera. In this app use will be able use android device camera to point at any colored object and get a name of the color in text format as result.

Background

Color blindness, also known as color vision deficiency, is the decreased ability to see color or differences in color. Its incurable genetic disorders with Chromosome X
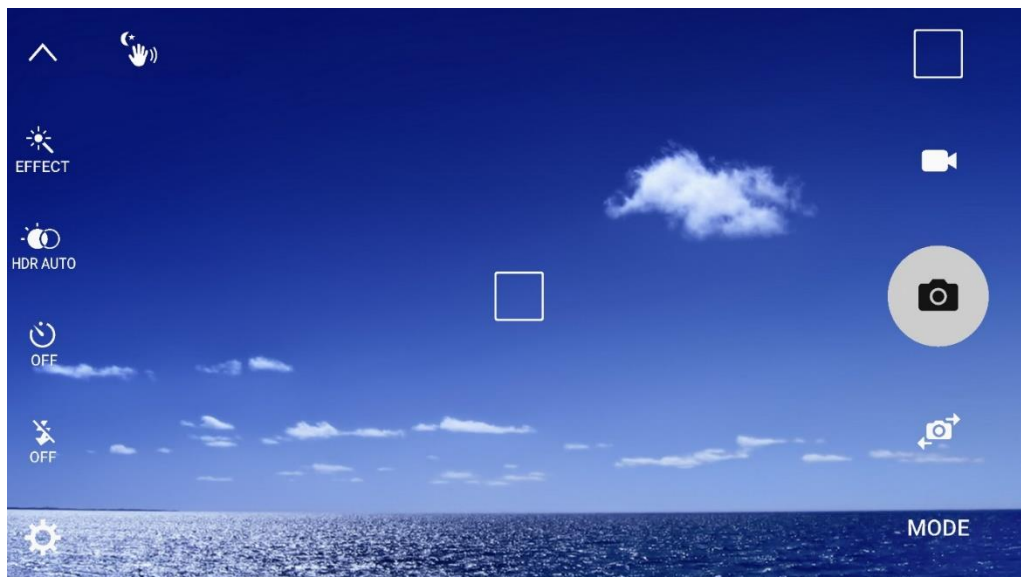
In the United States, about 7 percent of the male population—or about 10.5 million men—and 0.4 percent of the female population cannot distinguish red from green.

More than 95 percent of all variations in human color vision involve the red and green receptors in male eyes. It is very rare for males or females to be "blind" to the blue end of the spectrum.
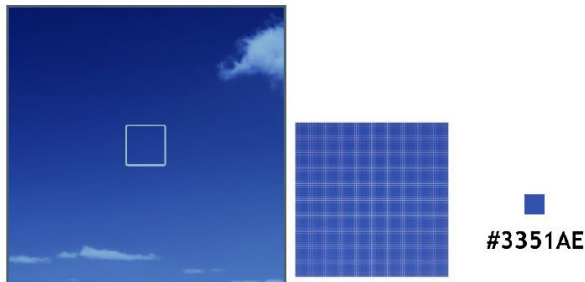
2. Application Design

Module 1 (Camera to Image)

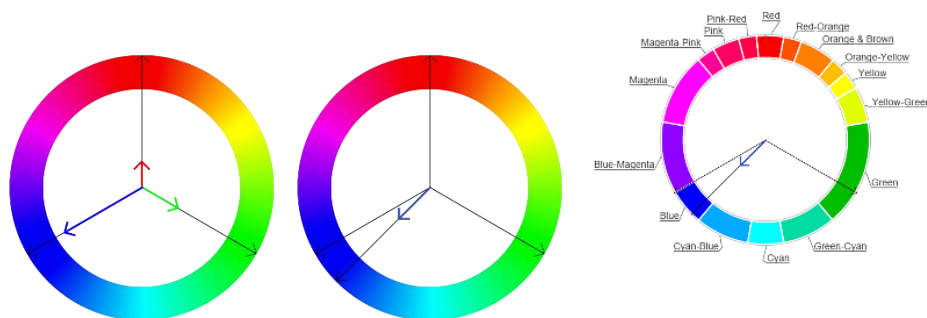• Use camera to capture the image in the android app environment.

Module 2 (Image to RGB)

• Use the image from module 1 to get RGB value of the interested part of the image.

• Select the interested part of the image.

• Store that part in separate buffer.

• And downscale it to 1 by 1 Pixel resolution.

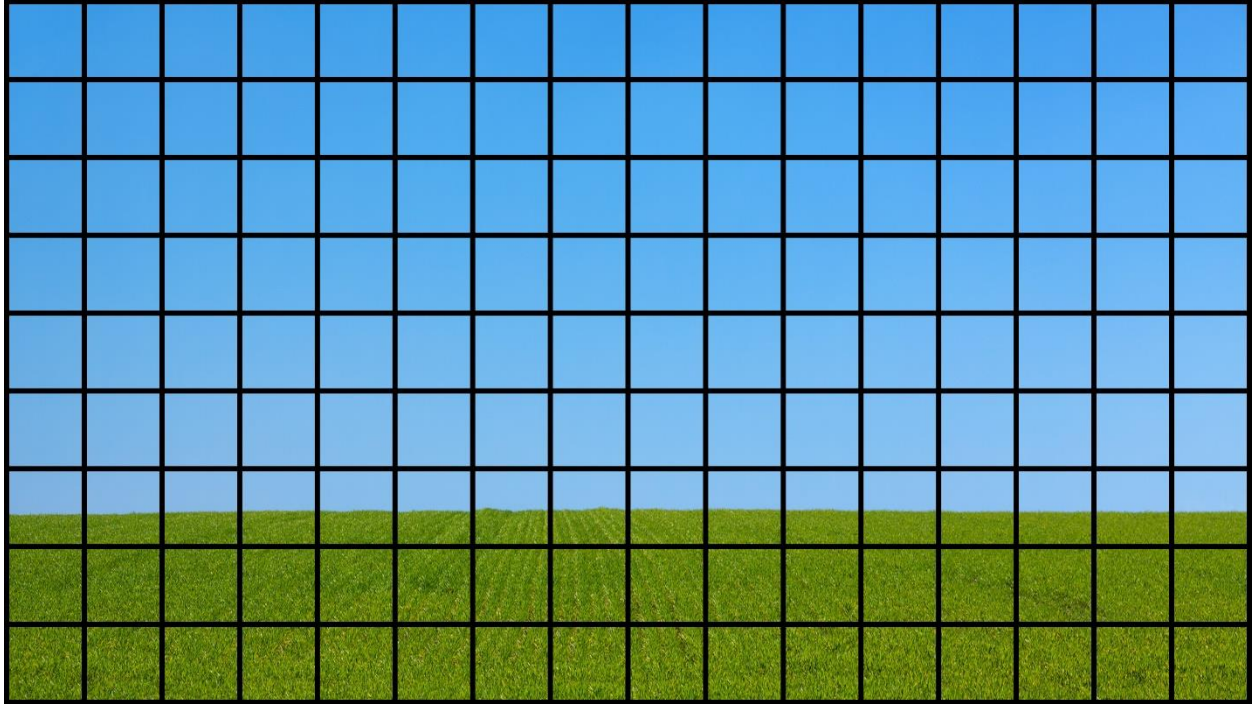• Pass RGB values of the that 1 by 1 Pixel buffer to module 3

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Module 3 (RGB to name)

• Covert RGB value in to its hue representation.

• It is possible with vector addition. Consider three vectors for each value of RGB.

• R being 0 in direction with magnitude value of R in RGB

• G being 120 in direction with magnitude value of G in RGB

• B being 240 in direction with magnitude value of B in RGB

• When we add them by vector addition, we get resultant vector with direction of its hue.

• That hue helps us to map the color to its name.

Module 4 (grid)

• Run same tool all over image.

• Remove duplicates and sort the result

• Display only top 2 colors

3. Application Implementation and Evaluation

Important classes

MyColor Class to map RGB to name

ProcessImage for rest image processing

To create a tool to help color blind people to identify the color in the real-world with the help on device camera. Based on the android mobile app technology. The app will take photo of the color object in the real world. Preform image processing to filter out the noise in the image for result output accuracy. And based on the RGB values of the image identify the color of the object so that it can be given as output in textual format.

4. References

References

http://www.color-blindness.com/

https://en.wikipedia.org/wiki/RGB_color_model

https://en.wikipedia.org/wiki/Hue

https://en.wikipedia.org/wiki/Color_blindness

5. Experiences and Thoughts

In camera activity app crashes if app orientation is change. I tried to debug. But, was not able to understand the problem.