CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)

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Project Number

36769

Project Title

C-Color: Colorblind Smartphone Application

Abstract

Objectives/Goals

Over 560 million people are colorblind. These people cannot see all colors and will have a hard time distinguishing between two colors that, to them, are too similar to each other. For example, they have problems when they can#t see where writing appears on a similar colored background. The application C-Color solves these problems by being a mobile application for Android and iOS devices. The application labels the color of the selected part of the screen to help the user know what color it is. The app also has a mode where the user can capture an image and press checkboxes to change certain colors to either black or white. This color changing mode can help the users distinguish between two similar-looking colors by making one of those similar-appearing colors dramatically different.

Methods/Materials

At the beginning of our design process, we looked at customer surveys to see what was great about our initial prototype and what needed fixing. Also, we tested the ability of the app to identify colors to see if the labeling feature needed adjustment. The app was tested on 36 different colors (3 times each) in normal, dark and bright environments to see how many times each color was identified correctly. These environments were created by darkening and brightening the image of the tested color range. There is also a customer feedback survey for our current app with pending results. These results will be used to update the app even further.

It costs $99 a year to be able to publish apps on the apple store. Google play has a $25 one time fee for a developer#s account. Android Studios, to make the android app, and Xcode, to make the iOS app, are free. This brings the total cost to $124.

Results

The original survey tests were very positive about the concept of the app. The color-identifying tests showed that most colors were identified correctly. The brightened test was a bit worse in sensing the correct colors than the dark and normal tests, but the wrongly identified colors were still very close to the actual colors.

Conclusions/Discussion

These tests don't only test the labeling function, but also test the color-changing algorithm. Because the colors were off by very little in the tests, the application is very successful because people have slightly different limits of what they consider one color or another. For example, one person may see pink when another person and C-Color may see purple.

Summary Statement

We created an effective application that helps colorblind individuals distinguish between colors and understand what colors are present.

Help Received

We designed and built the application and ran the surveys and tests ourselves.