**Color Detector Project**

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**Discipline: Computer Engineering Technology**

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# Declaration of Joint Authorship

We, Divendra Sowamber, Suong Luong and Rutvij Dodiya confirm that this work submitted for the capstone project is the joint efforts of ourselves, and is expressed in our own words. Any uses made within of other works of any other author, in any form (ideas, concepts, numbers, previous technologies, statistics, programs, texts) are properly acknowledged at the point of use and included from the references list. For the work contribution, Rutvij Dodiya has handled the Database and Coding framework, Kritish Sowamber has handled the sensors with hardware and Suong Luong has handled mobile application aspects of this project.

# Approved Proposal

## Executive Summary

## Background

# Abstract:

The purpose of this report is to provide a detail description for the final capstone project - Color Detector. This project is a combination of hardware and software application components. The hardware is set up with Raspberry Pi and three attached sensors. The software app provides users an interface to interact with the hardware platform. Users will have different selection on the app to retrieve data, view fruit names and conditions(ripe, unripe or ready). It will display the fruits name, fruits conditions based on their color value (hex value). Other information readings include the examining in real-time process such as displaying surrounding temperature, battery-life of the device and location with current timestamp. Based on requirements of this course, this capstone project which is designed to solve real world problem. To be specific, it can be used individually or in farm area where people grow fruit and want to check the progress of fruit ripeness anytime regardless the user location. This helps the users determine the proper time to harvest. For more support, users will be able to check device battery, usage time with statistics and graph. This software also has different languages as well as customizations to help users navigate simply and easily.

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# Introduction

This capstone project (Color Detector) is based on assigned sensors from CENG317 Course (TCS34725 Color Sensor , TMP007 Temperature Sensor, ADS1115 16-Bit ADC- 4 Channel Sensor). The core function of this project is to determine fruit ripeness from the color value based on the color sensor. This software application works with hardware platform and could be set up in one location while the user can control the device remotely from another location. To have access to the app, the users must login or register an account using an valid email address and password. After login, the users will have different options to retrieve the data in offline mode or real-time in online mode. While the hardware device is running, it will keep pushing data such as temperature in the current environment, battery remaining to operate, and the color value of the fruit to the database. Both hardware and software work with Firebase mobile platform to store and retrieve data.

# 2. Project Description

## 2.1 Problem

## 2.2 Rationale Behind Project

## 2.3 Project Scope

## 2.4 Software Requirement Specifications

### 2.4.1 Database

### 2.4.2 Mobile Application

## 2.5 Project Overview

### 2.5.1 Bill of Materials

### 2.5.2 Time Commitment

### 2.5.3 Mechanical Assembly

### 2.5.4 PCB and Soldering

### 2.5.5 Power Up

### 2.5.6 Unit Testing

### 2.5.7 Production Testing

## 3. Progress Reports

### 3.1 Report 1

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| |  | | --- | | Suong Luong <luongkingsley@gmail.com> | | Fri, 1 Feb, 13:24 |  | https://mail.google.com/mail/u/0/images/cleardot.gif  https://mail.google.com/mail/u/0/images/cleardot.gif |
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The purpose of this report is to provide information about current project status - Color Detector

**I. Hardware:**

The hardware is properly assembled now. All three sensors (Color Sensor TCS34725, Temperature Sensor TMP007, ADS1115 16-Bit ADC) are properly assembled on the same PCB. The address for each sensor is also tested. In conclusion, the hardware is fully functional and in good condition. It is connected to Firebase platform for pushing data later.

**II. Software:**

The layout for all the activities need to be designed to have the same theme and font. The software is also connected to Firebase platform to retrieve database. Things may be changed in the next couple weeks for the condition codes when real-time data are stored.

**III. Problems and Resources:**

Currently, the coding part and stored data for this project need to be completed. RGB range value to store on Firebase are considered.

*Github websites:* <https://github.com/SuongLuong/CapstoneProject>

*References:*

<http://bradsrpi.blogspot.com/2013/05/tcs34725-rgb-color-sensor-raspberry-pi.html>

hps://[www.rapidtables.com/web/color/RGB\_Color.html](http://www.rapidtables.com/web/color/RGB_Color.html)

<https://medium.com/@dvd.ciri/raspberry-pi-firebase-home-automation-d5a237f18fb5>

**IV. Financial update:**

The cost for this project includes sensors, solar panels, header pins, PCB, Raspberry Pi 3 B+. Most of the parts are provided by Humber Prototype Lab. The total cost for others( Raspberry Pi, sensors, solar panels): $188.08

In the future, some additional parts such as: screen for Raspberry Pi may be considered.

**V. Contribution**

All team members are working together for PCB and for each sensor, different codes will be combined for different readings.

Sincerely,

Kingsley Luong

https://ssl.gstatic.com/ui/v1/icons/mail/images/cleardot.gif

### 3.2 Report 2

### 3.3 Report 3

## 4. Conclusions

## 5. Recommendations

## 6. Technical References

## 7. Appendicies