AN INTELLIGENT COLOR SENSING SYSTEM FOR BUILDINGS

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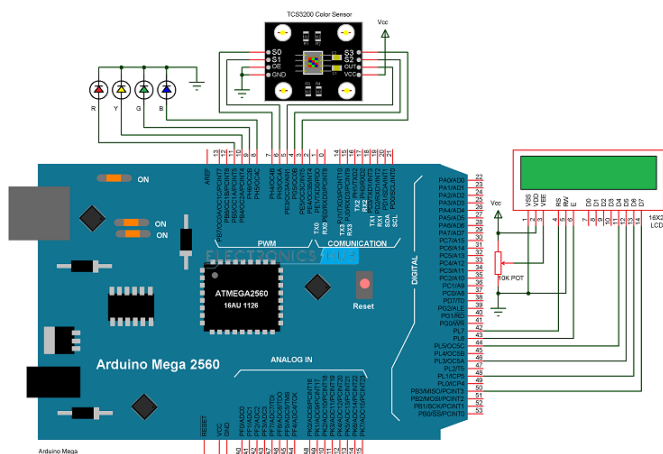
Abstract - An intelligent color sensing system using Arduino is made. The developed system can measure the color of various materials. The color sensing system is developed and implemented using Arduino, Light Emitting Diodes and CMOS color sensor. The yield of the shading sensor is specifically corresponding to the light force of occurrence light. It is adjusted so that it can gauge the essential hues, for example, red, green, and blue. A graphical UI (GUI) is produced for showing the shade of divider. ICS (Intelligent Color Sensor) is adjusted effectively. The ICS framework is anything but difficult to work productive and Accurate

Key Words: ARDUINO,COLOR SENSING,BUILDINGS

1.INTRODUCTION

A Color sensing element, because the name suggests, could be a device that senses or detects colors. A color sensing element can use AN external means that of emitting light-weight (like AN array of white LEDs) then analyze there flected light-weight from the item so as to see its color. Color sensors can provide AN correct color of the item. There are a good range of applications of color sensors like sorting objects by color quality control systems, printer color improvement etc. In this project, we've got designed a straightforward Arduino Color sensing element application , that has a capability to notice totally different colors. Technically speaking, color sare figments of our imagination. once we see a red apple, it implies that it reflects that particular wavelength ($\sim$700 nm for Red) of the magnetic attraction spectrum . This energy is absorbed by the attention and supported some chemical reaction, the brain says that specific wavelength is red color . For computers, a sensor that totally differentiates between different colors can facilitate in determinative the color of the item. we'll see a simple color sensing element employing a picture electrical device (Light Dependent Resistor – LDR) and 2 totally different colored objects, say red and blue. When we shine bright red light-weight on each the objects, the red object can mirror the sunshine whereas the blue object can absorb it So, once red light-weight is incident on each the red and blue objects, the red objects seem brightest to the LDR because it reflects most of the red light. Similarly, once a cerulean light-weight is incident on each the objects, the blue object can seem the brightest to the sensing element. This

method is simply to know the operating of a color sensing element and therefore theactual results might not be correct. Practical Color Sensors likeTCS3200 are a small amount a lot of sophisticated than this. The TCS3200 colorsensor could be a programmable color sensing element that converts color light-weight tofrequency. The output frequency of the sensing element is directlyproportional to the intensity of the sunshine mirrored from theobject [1]. Low price color sensors are investigated for monitoring plant growth within the laboratory [2]. In most of those studies, one color parameter, either redness or chromatic color is employed them. however, within the case of leathers, all the parameters as well as the depth of shade ought to match with cheap level of acceptable for leathers during a cluster. In different words, matching of shades during a 3-dimensional color area is critical to get reliable sorting to attenuate color variations during a cluster. Use fulness of machine vision for classification of shades for textile materials has also been studied. The comprehensive literature review shows that the color detection system supported the distinct parts such as photodiode, integrated circuits (ICs), light-weight Dependent electrical device(LDR), Zener diode, RGB LEDs and slow external Analog-to Digital (ADC) ICs aren't correct and reliable. Schmitt trigger is additionally incompetent to enhance the accuracy offer quency-to digital conversion for color detectors. The color detection supported image process isn't correct within the presence of direct daylight. The direct daylight introduces the various illuminations that turn out the various color intensity of the object surface. Therefore, to deal with the analysis gap and therefore the problems mentioned on top of, AN intelligent color sensing system for building wall is developed, that focuses on the color sensing, color classification, and building wall color determination technique to enhance the accuracy of color activity, speed, and less power consumption [3].In this case study we've got used the color sensing element for sensing the color from the environment employing a sensing element and spending it the transparent pictures of building or any objects employing a PHPOC shield. The final results obtained within the monitor.
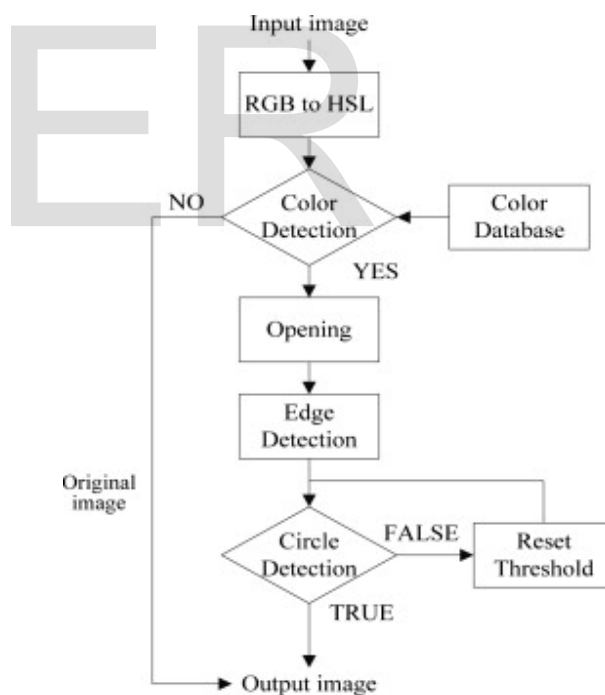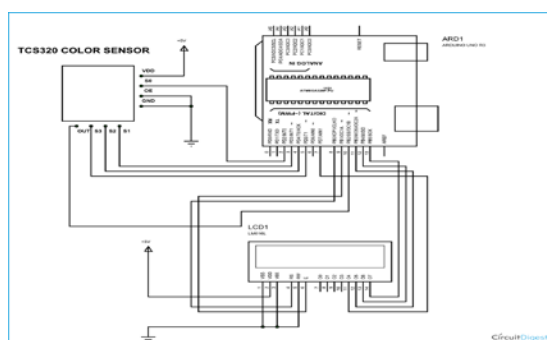
2. SYSTEM DESCRIPTION

An Intelligent Color Sensing (ICS) system consists of the color sensing unit, process unit, color detection formula for color model, and therefore the graphical computer program (GUI) application. Within the developed system, The LED lightweight irradiates the wall color and therefore the mirrored lightweight from the wall is detected victimization the CMOS color sensing element. The process unit acknowledges the output parameters of color sensing element (R, G and B values) for every change terms of its frequency. The frequency values are graduated victimization the color sensing GUI. The developed system consists of TCS230 color sensing element, Arduino, power offer and laptop. the choice line and output line of the color sensing element is connected to the digital line of Arduino. The parameters of color sensing element (RGB) are measured kind output line. The Arduino board is interfaced with the laptop via USB port and shows the result on the laptop GUI. The model setup of developed wall color sensing system, that represents the color sensing unit and Arduino unit is interfaced with the portable computer to show the color of wall victimization GUI on portable computer

3. SYSTEM DETAILS

- **Color Sensing Unit -** The light supply is that the mixture of brightness, hue, and saturation. the light supply emits the light of various wavelengths. The

red, green, and blue is that the primary wavelength of sunshine. the planning of color detector is predicated on primary wavelengths of light. the color sensors are victimization 3 photodiodes as color filter (red, green, and blue). The physical property and penetration depth of photodiode is looking on the wavelength. The image current is generated once the light incident on photo material [3].

- **Color Model and Color Detection Algorithm -** The mathematical model is representing the color model with colors of light like red, green, and blue. within the color model, the additive colors are the mixture of primary colors.
- **Arduino Board–** The Brain of the color sensing system.
- **PHpOC Shield –** This provides wireless network access to Arduino.

4. SOFTWARE IMPLEMENTATIONS

The computer code used here is Arduino. It provides a number of libraries to create the programming of the system thus simple. The code is been uploaded to the Arduino board via USB cable. The process is simple. Any set of instructions can be programmed into the Arduino board.

5.HARDWARE CONSTRUCTION

The main a part of the system is Arduino micro-controller. Arduino is AN open supply physics platform accompanied with a hardware and software package to style, develop and check advanced physics image and product. To communicate with user over an internet site, a server is needed which can send and receive knowledge from micro-control lertouser and vice-versa. so as to realize a desired output, a correct algorithmic rule is needed. The algorithmic rule comprises the subsequent steps:

Step 1: Power ON the system which incorporates the microcontroller, sensors and alternative peripherals.

Step 2: Initialize the system, that consists of sensors, Wi-Fi module and program.

Step 3: Browse the system configuration file which suggests to browse the directions from the configuration file and therefore the system operation consistent with the configuration file.

Step 4: browse knowledge from the sensors.

Step 5: Send the info to the user through the PHpOC Shield to the display.
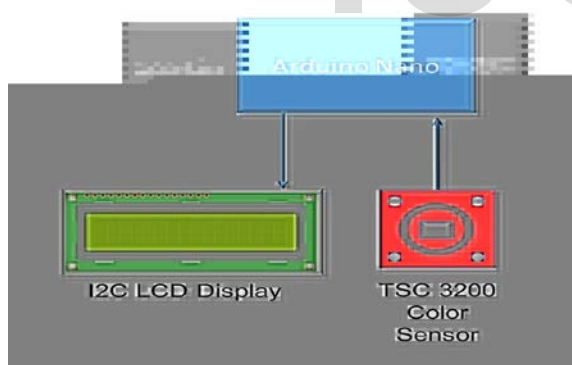
6.NEED FOR THE PROJECT

It will be much useful to know how the new building looks in various colors. Thus, the user can decide which is the best for their building and work according to it rather than creating a lot of mess. It makes the work easier and more efficient. It saves a lot of money and time and also can be implemented in any type of buildings.
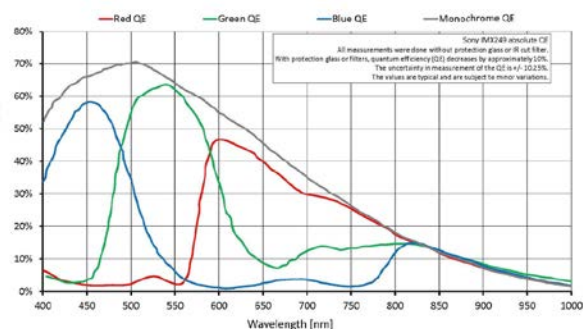
7.ADVANTAGES

We will now [3] discuss some of the benefits associated with the installation of an color sensing system for your landscape and the environment.

Save Time

It saves a lot of time by instantly giving the after results without even implementing in real life..

Saves Money

Saves a lot money by choosing the right color for the buildings.

Ready To use

It can be used instantly anywhere at any time.

Portable

It is portable and can be carried anywhere without creating much problems

Effortless Functions

Amid coding of Arduino, you will see a few capacities which make the life so natural. Another preferred standpoint of Arduino is its programmed unit change capacity. You can state that amid troubleshooting you don't need to stress over the unit's transformations. Simply utilize your everything power on the fundamental parts of your tasks. You don't need to stress over side issues.

8. CONCLUSIONS

In this analysis, Associate in Nursing Intelligent Color Sensing (ICS) system for wall color detection is developed. From the results, it is over that the color sensing element unit and color model with min-max algorithmic program is employed to calibrate color for building wall. The results of planned system square measure stable, and mark. The developed system has been tested with success. The developed system has many blessings like low value, quick response, energy economical, and a lot of accuracy as compared to the present color sensing systems. The Intelligent Color Sensing (ICS) system with Wi-Fi and web

of Things (IoT) technology are going to be a lot of positive system in future. The wall color sensing element and building survey knowledge note book are going to be group action in future.

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