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Automated Gadget to Descry Fiat Currency Bills with Gross Balance Updater

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Abstract: ***Tallying and assessing bills notes with precision and the high rate is a formidable crisis for banks, shops, and even customers. Formerly the appearance of cash counting devices, people used to measure money manually. This protocol was not only dreary and time-consuming but also causes many errors during evaluation. This mini-project intends to see whether appliance vision strategies can be used to comprehend and measure Indian currency bills accurately and at an increased rate. Although there are money distinction algorithms catalogued in the literature, the proposed applications operate offline with stagnant images of the bills/paper notes. In this proposed mini-project, a color sensor-based procedure for the categorization of striding paper notes/bills is examined.***

Keywords: Arduino Uno, Currency Counting Machine, Color Sensor, Liquid Crystal Display

I. INTRODUCTION

A programmed paper tallying gadget plans the idea of quick and proficient checking of paper without mortal undertaking. The figured paper checking gadget uses the inserted framework Arduino for the working of the machine. It utilizes getting a handle on innovation todetect the check entered and communicates the reciprocal signs to the info terminals of the IC in the Arduino board. The utilization of the Arduino board makes the machine more efficient in working. The Arduino board on acquiring the signs sends them to include pins of a showcase which demonstrates the amount of the papers (money notes) checked. The significant check of money notes can be figured proficiently and in fewer endeavors. Adding up to something and sorting notes with speed increase and exactness proceeded with inescapable trouble to shops, banks and people on account of huge deviations in recent Indian paper cash. The manual cycle of tallying and ordering money notes is a tedious occupation wherein mistakes are probably going to occur because of fatigue. This task is proposed as a remedial model for the issue totally the cash for a minor scope like household purposes and in small businesses or shops at low creation costs.

II. LITERATURE SURVEY

Sargano et al [1] designed the latest smart system for Pakistani bills/paper currency recognition. The proposed device required lesser duration as compared with the rest available systems. The proposed system uses the Backpropagation Neural Network for identifying and classifying the bills/paper notes. A total of 350 paper currency notes has been tested with more than 90% efficiency.

Risfendra Risfendra et.al [2] proposed the methodology that uses the Arduino and the color sensor TCS3200 for classifying and sorting the objects as per the color shade.

Yulita Salim et .al [3] proposed a system that utilizes the principle of the Color Detecting/Sensing Methodology. The module is used to detect and scale the concentration levels of the Iodine in the given sample of raw input salts/food sample.

Kolachina Sai Saranya et.al [4] proposed the device that aids blind/impaired people to count the paper bills/currency notes. The proposed architecture utilizes the image processing algorithm and outsources the output in the audio waveform so that the blind person can understand.

IyadAbu Doush et.al [5] proposed a system that helps in classifying the paper currency notes and coins. For efficient classification, the proposed module uses the scale-invariant feature transform (SIFT) algorithm.

III. SYSTEM INFORMATION

The implemented system consists of the architectural networking of the various hardware components such as the Arduino Uno Processor, White Beard Board, LCD (16*2) display and the Color Sensor. The color sensor used is of TCS-3200 series. The Color sensor is connected with the Arduino Uno Processor board via the Bread Board along with the LCD display. For increasing the accuracy of the overall working of the color sensor, the cardboard black box is been assembled so that the color sensor can only focus on the incoming currency. The whole module requires the electric energy to operate which is provided with the use of the

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IV. SYSTEM ARCHITECTURE

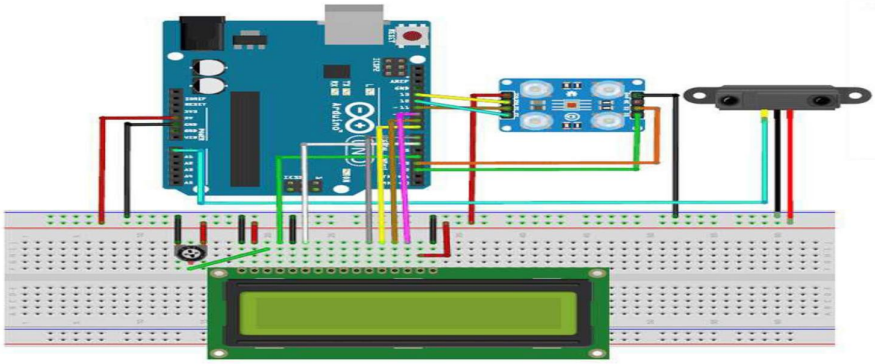


Fig 1: System Architecture

V. SYSTEM MODULE

A. Paper Currency Detection Module

The TCS3200 Color Sensor has Red, Blue, Green and Clear filters respectively. By the frequency, the intensity of the color is being decided. In the pin configuration, S2 and S3 pin on the color sensor are for photodiode purpose (red, green or blue). During the working of the module, the typical photodiode is being selected and the Pulse IN feature of the Arduino Uno board is being triggered/activated to the output pin of the color TCS sensor. This working helps to calculate the exact frequency of the outsourced signal. This same working is being used for the R, G and B photodiodes respectively. As per the values we get on the serial monitor, the color is detected. The coding module contains the various Indian paper bills/currencies notes colors classified as per the detected colors with the aid of IF-ELSE loops. For example- the green color is being assigned for the 100 INR paper bill whereas the yellow color is being assigned for the 20 INR new paper bill, likewise. Working of the color sensor TCS-3200 is been displayed in the Fig.2

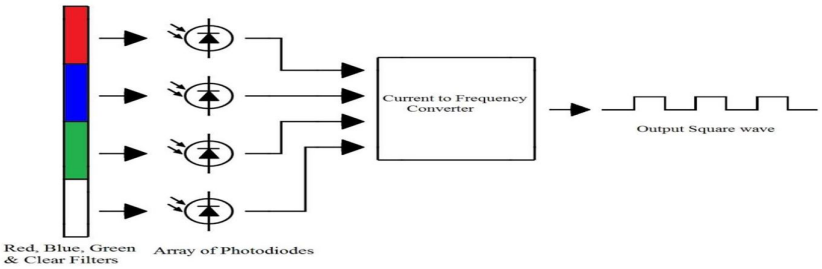


Fig 2: Color Sensor Working

B. Currency Detection and Balance Amount Deduction

The first module of the system detects the color of the inserted paper bill / currency and as per the color variation, it detects the paper currency. Once the amount of the paper is detected, then that respective amount is been deducted from the total assigned balance. Refer Fig.3

Example:

Initial balance: 10,000 INR
Currency note detected: 100 INR
Updated balance: 9,900 INR



Fig 3: Amount Deduction (Output Module)

VI. TECHNOLOGY USED

A. *ArduinoUno*

Arduino Uno is a tiny single-board which is able to read the input signals and to process these signals to deliver as per the respective outputs from it.

B. *Arduino IDE*

Arduino IDE is used to programmed the Arduino boards. It is use to write the modular commands and to load those commands on theArduino board.

C. Hardware Requirements

1) Arduino Uno Board
2) Color Sensor- TCS-3200
3) White Bread-Board
4) LCD (16*2)
5) Jumping Cable

VII. COMPLETED DESIGN

The Fig. 4 is the photograph of the hardware module which successfully illustrates the working of the currency / paper bills detection. Once the color sensor successfully captures and detects the paper bill, the initial loaded amount number (in INR) is been deducted. Here the initial balance is set to 10,000 INR.

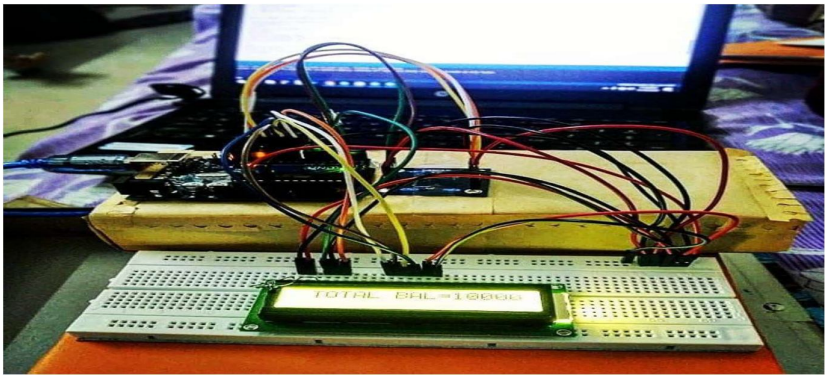


Fig 4: Final Implemented Module

VIII. CONCLUSION

The piece of the gear is an enunciation of a creative procedure in the development of a money tallying machine utilizing Arduino. Each activity work has an impression or objective behind it. Our task may not ensure to shape the agreeable Machine but it will fundamentally vow to have the option to be used as the root for extra headways in the local household use / small shops where the counting of paper bills is done. The significant quality of the analysis is its transportability and flexibility. Since it is executed on limited scope (family need or minor

business/shops) this works with it to be versatile and the capacity to manage it easily in any sort of specialties. The machine execution will help to replace the errors caused by the people in counting the paper bills. It will figure paper cash capably and effectively with a very less comparable cost as that of the current present modules in the market.

IX. FUTURE WORK

Future working of the project will focus on the increasing the accuracy of the outcome along with the making the overall external design more compact to make it more feasible to use. For increasing the accuracy of the color sensor, more advanced color sensors can be used so that the module will able to operate and detect variety of the paper bills / Indian currency notes. Toadd the more functionality on the screen, the screen size can be increased by replacing the 16*2 display with the bigger one. By connecting the system with the android system, the user can parse the transitions happened at its side. Also, Arduino Uno can be replaced with the Raspberry Pi Processor to increase the overall processing speed.

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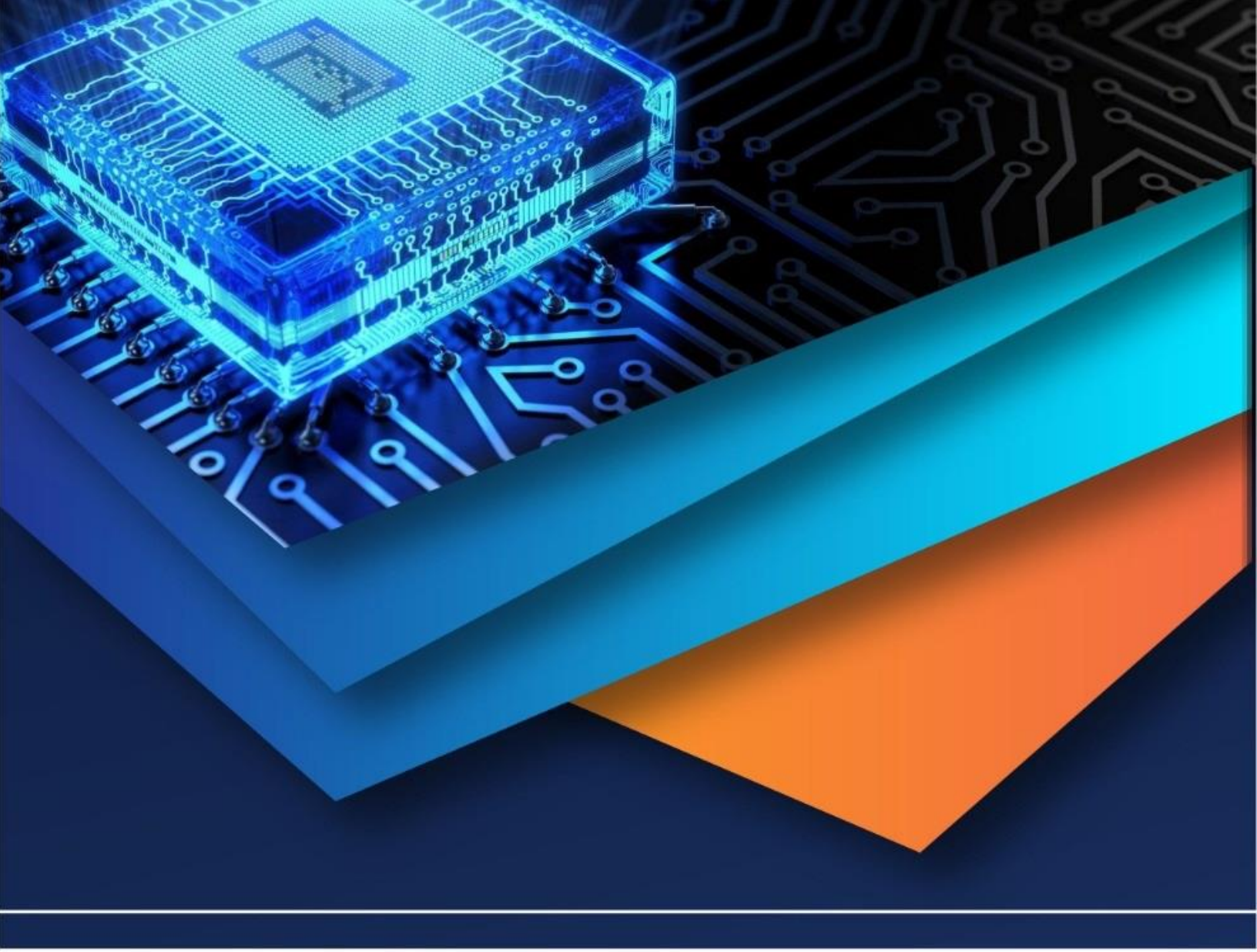
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