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Color Sorting System Using Arduino Nano

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Abstract: ***Sorting of object is a vital mechanical method within which troublesome work is kind of required. Chronic manual arrangement makes consistency troubles. Machines will perform in the main dreary assignments superior to human beings. Working man exhaustion on ordered producing structures may {end up} in reduced execution, and purpose troubles in holding up object fine. A worker who has been showing analysis enterprise over and over could in addition within the end ditch to acknowledge the color of tem, however a machine in no way. In this paper we have describe on the sorting machine which can be help to sort the products. There's a large usage of the many product in our day to day life, associate degreed producing of this products are tired many large scale and tiny scale industries. Arrangement makes quality consistency issue. Today the most issue that's visage when the assembly is of sorting arrangement of things in an trade may be a uninteresting trendy process, that is by and huge done physically. We are implementing the color sorting machine with the new feature which can count the marbles as well as detect.***

Keywords: Color Sorting, TCS3200, Arduino Nano, LCD display.

I. INTRODUCTION

In the cutting-edge-day situation of competitive manufacturing in industrial zone performance of producing holds the necessary element for achievement. Its miles essential to beautify manufacturing pace, lower the labour charge and scale back the breakdown time of production gadget. Merchandise ought to be taken care of in various ranges of manufacturing and manual sorting is time overwhelming and labour extensive. For sensing TCS3200 coloration device has been used. We are using this sensor to sense the color and given the signal to the microcontroller. Layout of a innovative venture mentioned as item sorting system by means that of recognizing the sole of a sort reminder the item has been leader goal of the challenge. Accumulating the objects from the hopper and distributes those objects to their correct space supported their coloration even they'll be distinctive in coloration. Several paintings environments aren't appropriate for manual sorting and a number of areas are risky for humans to paintings on. Consequently to avoid the unstable work, time consumption and laborious paintings catch twenty two situations. This image is constructed as simple digital gadgets like microcontroller for processing, Servo motors for actions and coloration device for recognizing exclusive coloured devices.

II. METHODOLOGY

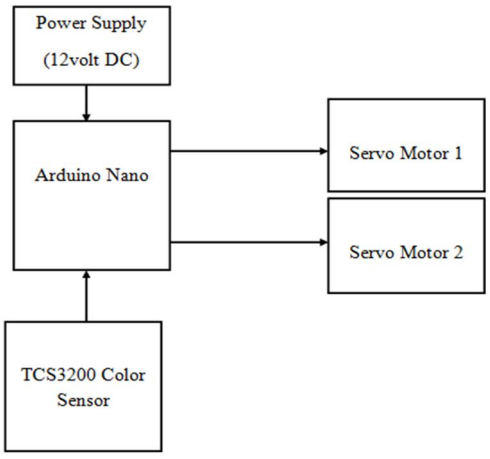


Fig. 1 Block diagram of color sorting system.

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A. Components Details

1) Arduino Nano

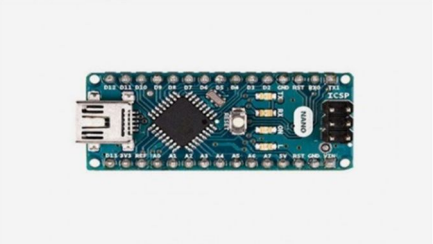


Fig. 2 Arduino Nano.

Specification of arduino nano

a) It has inbuilt microcontroller ATmega328.
b) It is operating at voltage (logic level) 5 V.
c) The input voltage (recommended) 7-12 V.
d) The input voltage (limits) 6-20 V.
e) It has Digital I/O Pins 14 (of which 6 provide PWM output). It has Analog Input Pins: - 8.
f) It works on DC Current per I/O Pin 40 mA.

2) TCS3200 Color Sensor



Fig. 3 TCS3200 color sensor.

The specifications are as follows:

a) It operate at power: 2.7V to 5.5V
b) This module size is 28.4 x 28.4mm (1.12 x 1.12″)
c) Interface: digital TTL
d) high-resolution conversion of sunshine intensity to frequency
e) Programmable color and complete output frequency
f) Communicates on to microcontroller

Table. 1 Pin description of TCS3200 sensor

Pin Name	I/O	Description
GND	-	Power supply ground
OE	I	It used to enable for output frequency (active low)
OUT	O	It has Output frequency
S0, S1	I	It has output frequency scaling selection inputs
S2, S3	I	Photodiode type selection inputs
VDD	-	Voltage supply

3) Adapter



Fig 4 DC Adapter (12 Volt).

We are utilising a 12 volt adapter that can provide a 12 volt 1.5 ampere supply for this project because it requires DC power.

4) Voltage Regulator IC 7805

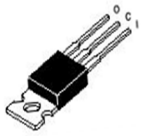


Fig. 5 Regulator IC 7805.

The above graphic depicts the ic 7805 regulator, which may be used to produce a 5 volt output. VIN, GND, and Vout are the three pins on this IC. All of the components in our project function on a 5 volt system.

5) LCD display

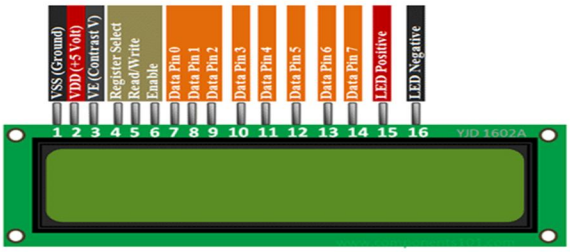


Fig. 6 LCD display.

The above figure show the diagram of LCD display 16x2 which is used to display the character from microcontroller. It has the 16 pins and it operate at 5 volt dc. It has a feature to control the backlight. This display has 2 rows and 16 columns.

B. Software Platform

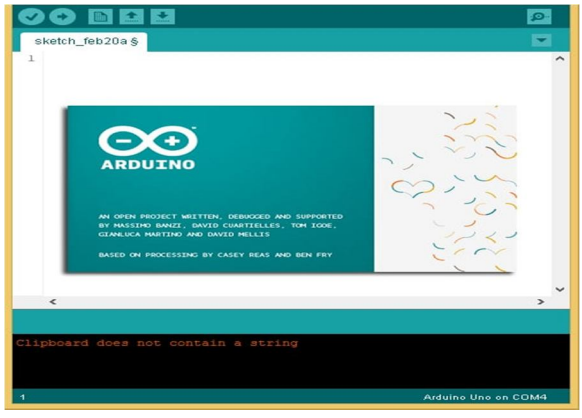


Fig. 7 Arduino IDE.

The platform of the Arduino IDE, which is used to code the Nodemcu, is shown in the diagram above. This platform supports only a few languages, including C and C++. This program is free and open source. This platform offers a variety of boards, including Arduino UNO, Nano, Mega, Nodemcu, and others.

III. WORKING OF PROJECT

When the 12V power supply is connected to the system, the first servo motor starts to rotate. The motor rotates and knocks marbles or jems from the pipes under the color sensor that detects its color. The Arduino Nano serves as the main controller to which the color sensor and two servos are connected. It analyzes the data received from the color sensor and then transmits the command to the servo motor. The color sensor is mounted face down when it checks the color of the oject and this test matches the color frequency with a custom function that helps in determining the color of the object. The color sensor will send data to the Arduino the Arduino will process this data according to the downloaded code and give commands to the servo motor to move and arrange the walls. The top servo ensures that an object part is delivered after the color of the object is determined it moves the object from the source to the color sensor and then to the drop hole with a few slides y a bottom servo. The slide platform is then configured to deliver the object to the bucket container where the colored object is stored. Then the upper servo rotates again until the pins are inserted into the glass of the guide cup. We also count shadows detected y the sensor and show details on the LCD.

IV. ADVANTAGES

A. Fully Automated Since there is no human intervention in the whole process of the sorting machine, this machine has fully automatic machines.

B. Useful for Industrial Applications This machine is useful for industries whose work depends on different colored components.

C. It is time efficient because the process is automated. This machine can sort components in much less time, resulting in time efficiency.

V. APPLICATIONS

The applications of color sorting system are as follows.

1) This system used for sorting grains.

2) It is also used in diamond industry.

3) This system is used in industries to sort small colored components.

4) It is also used for sorting the lemons.

VI. CONCLUSION

We are implementing and coming up with the color sorting machine which may be work automatically. During this color sorting machine, RGB colours are sorted. We tend to are additional an additional feature in this system it can count the color bolls and show the small print on LCD. This framework utilizes Arduino nano that makes this model easy to utilize which is more additional effective. the most failure are going to be caused if the sensing of objects in step with color isn't done. Therefore, it's vital to possess correct and checked sensors. Further, creating fascinating changes it may be employed in small-scale and large-scale industries as well.

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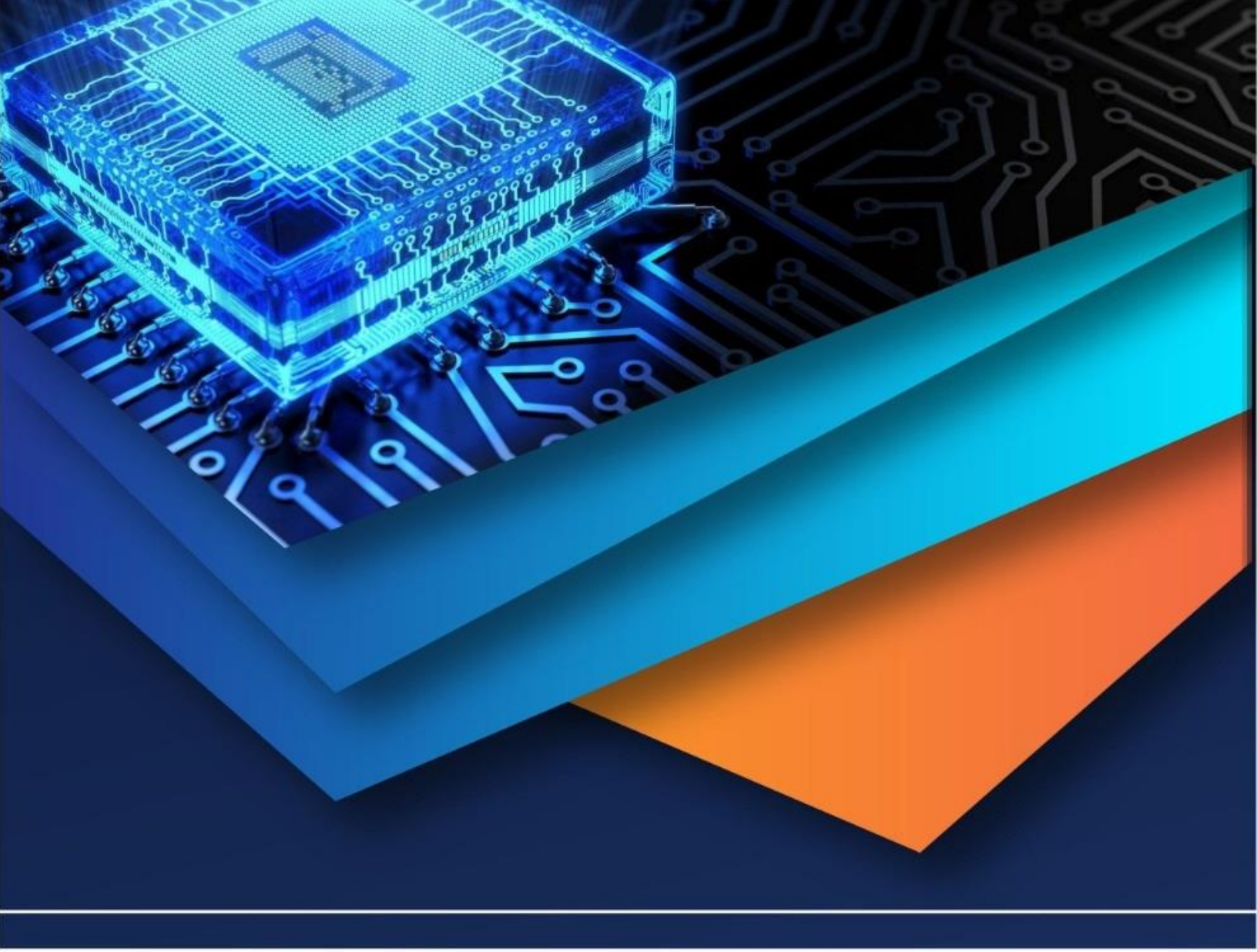
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