



ARDUINO BASED COLOR SORTING MACHINE USING TCS3200 COLOR SENSOR

¹Tumma Nishitha, ²Dr.K.Venkatachalam, ³P.Ventakesh

¹M.tech Scholar, Dept. Of ECE,Audisankara College of Engineering and Technology, Gudur, Andhra Pradesh

² Associate Professor, Dept. Of ECE,Audisankara College of Engineering and Technology, Gudur, Andhra Pradesh

³ Assistant Professor, Dept. Of ECE,Audisankara College of Engineering and Technology, Gudur, Andhra Pradesh

ABSTRACT:

Sorting objects is an important mechanical process that requires a lot of hard work. Consistency issues result from repetitive manual organizing. Compared to humans, machines are superior at most mundane tasks. Labourer exhaustion on sequential manufacturing structures can result in decreased execution, and purpose troubles in retaining up object fine. A employee who has been appearing research undertaking over and over may additionally in the end forget about to recognize the colour of item, but a machine in no way. On this paper a compact records close to arranging of articles based totally on shading has been implemented making use of TCS3200 shading sensor with SERVOMOTORS associated with AURDINO UNO. Sorting of products is a very difficult industrial process. Consistency issues result from constant manual sorting. This paper describes a functional prototype for automatic colour-based object sorting. TCS230 sensor was used to detect the colour of the product and the Arduino UNO microcontroller was used to control the overall process. The frequency analysis of the TCS230 sensor's output is used to identify the colour.

I.INTRODUCTION

In today's highly competitive manufacturing environment in commercial zones, manufacturing performance is critical to success. It's miles essential to beautify manufacturing pace, lower the labour charge and reduce the breakdown time of production gadget. Merchandise should be taken care of in numerous

ranges of manufacturing and manual sorting is time consuming and labour extensive. The automatic sorting tool discussed in this paper enables the sorting mechanism to sort based on color. For sensing TCS3200 coloration sensor has been used. Color-based absolutely sorting is completed by reading the frequency of the sensor's output. The primary objective of the challenge was to design an innovative project known as an "item sorting system" by identifying the unique colors of the item. Accumulating the objects from the hopper and distributes those objects to their accurate area based on their coloration even they'll be unique in coloration. Many paintings environments aren't suitable for manual sorting and a few areas are risky for humans to paintings on. Consequently to avoid the unstable work, time consumption and hard paintings catch situation. This prototype is constructed from basic digital components like a microcontroller for processing, servo motors for actions, and a coloration sensor for identifying only colored devices. The ability to differentiate colours are essential for human's life as it gives us the awareness about the changes in surrounding through our vision. Moreover, by exploiting the ability of colour capture, intelligent machine gains the function to differentiate, sort and organize.

The project is made up of sensors that detect the color of the object and send that information to an Arduino Uno. The Arduino Uno then adjusts the DC motor that is just below the object slider to move it left and right and to keep it straight. The stations are colored red, green, and blue, and they will move clockwise or

anticlockwise depending on the color of the object. After every object placement, the slide will go back to its default angle position, awaiting the next colour object. Over the years, numerous individuals have attempted to program and create intelligent robots in a variety of ways with the goal of achieving specific functions or goals. There are assertions that have either directly or indirectly benefited the project. This project is developed with the purpose of minimizing the cost, optimizing the productivity and reducing human mistakes.

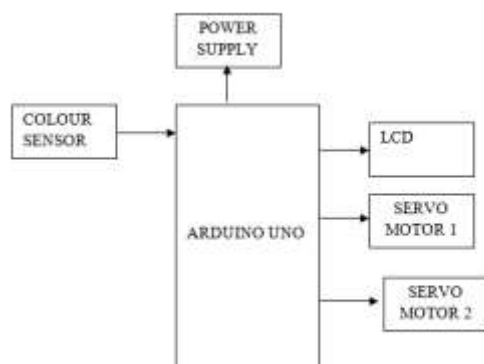
II.EXISTING SYSTEM:

Typically sorting of items is done manually requiring human work. Identifying a particular object and placing it in the required order is a taxing work especially in the industrial field wherein one needs to sort a large number of objects in a small interval of time and also weight of the objects is much larger than what an average human can bear.

III.PROPOSED SYSTEM:

The proposed system is designed for automatic sorting of Red or Green or Black colored products. The prototype consists of two servomotors, an Arduino UNO and a color sensing circuit using TCS230 (Fig. 3). Servo motors are used to control the conveyor belts. When the light falls on the product it is reflected back to the color sensor. As mentioned before, color sensor TCS230 has 4 color filters for green, red, blue and black (no color), which is opted by its select pins. Filters are selected by the program saved in the microcontroller.

BLOCK DIAGRAM:



VI.HARDWARE DESCRIPTION:

A.Arduino Uno Microcontroller :

Arduino Uno is a microcontroller board based on 8-bit ATmega328P microcontroller. In addition to the ATmega328P, it supports the microcontroller with other components like a crystal oscillator, serial communication, voltage regulator, and so on. The Arduino Uno has a reset button, six analog input pins, a USB connection, a Power barrel jack, an ICSP header, and 14 digital input/output pins, six of which can be used as PWM outputs. Arduino can communicate with other microcontrollers, another Arduino board, or a computer. Digital pins 0 (Rx) and 1 (Tx) of the ATmega328P microcontroller are used for UART TTL (5V) serial communication. The board's ATmega16U2 acts as a virtual com port for computer software and channels this serial communication over USB. There is no need for an external driver because the ATmega16U2 firmware makes use of standard USB COM drivers. However, on Windows, a .inf file is required. The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the Arduino board.



Fig 1:Arduino UNO controller

B.Color Recognition Sensor Module TCS3200D/TCS2300

The TCS3200 Color Recognition Sensor Module uses a high-quality light sensor allowing you to sense any color through a combination of Red, Green, and Blue. The module provides all of the pins of the TCS3200 on convenient 0.1" headers – ideal for use with PCBs, breadboard or stripboard.

Four white LEDs provide plenty of light for the [color sensor](#) and allow you to use the module in any ambient light.

The [sensor module](#) requires only a single supply voltage between 2.7V and 5.5V – making it compatible

with nearly all common microcontrollers, including PICs, AVRs, ARM, Arduino and more.

V.RESULTS:



Fig 2:Colour Sensor

C.SERVO MOTOR:

A **servo motor** is an electrical device which can push or rotate an object with great precision. If you want to rotate an object at some specific angles or distance, then you use servo motor. It is simply comprised of a straightforward motor which goes through a servo mechanism. In the event that the motor is utilized as DC controlled, it is called a DC servo motor, and assuming it is an AC fueled motor, it is called an AC servo motor. We can get an extremely high force servo motor in a little and light weight bundle. Due to these highlights they are being utilized in numerous applications like toy vehicle, RC helicopters and planes, Robotics, Machine and so forth.



Fig 3:Servo motor



Fig 4: Hardware Implementation

VI.CONCLUSION:

On the component even as any object of hues, as an instance, crimson, green, Blue is stored near the sensor, the shading LED of the comparing kind is grew to grow to be on giving the yield of the sensor. Inexperienced shading is tried on the begin and pursued through different. On the factor even as the sequential display is all commenced, a few developments appeared with the aid of manner of the start recurrence scaling relying upon the environment. It is probably noticed that the capabilities are numerous due to numerous sensor photodiodes, contingent upon the ghastly response on hand inside the sensor. In this paintings noticing those estimations of reaction is very tremendous. As an example of purple shading is delivered, the underlying clearly worth is going much less even from 70 to twenty-five. For portrayal inside the RGB model which has values for 0 to 255, the guide (), capability is applied to delineate assent esteems from 0 to 255. Similar pre coding can be linked for each single one-of-a-kind shading. The version is intended for arranging any item of any form which having length beneath 2cm. The version is designed to type various RGB-colored tablets, and it can sometimes type up to one hundred pills with 100% accuracy. The DC servomotor is prepared to pivot for various plots for each shading isolated. This version can be extended to ongoing programs in pharmaceutical companies and bundling companies. Additionally, it can be automated. Rapid engines deliver full-size outcomes for mechanical applications.

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