

# ORANGES SORTING USING ARDUINO MICROCONTROLLER (A Review)

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**Abstract** - In Agriculture industry is highly increasing demands for automation. Sorting of Oranges fruits based on color and size is complicated task. The technique associate with these work and implementation feasibilities are the fundamental studies. Variety of techniques are available for these tasks, along with their implementation plan. The main purpose of this paper is given us idea about such technique to identify performance-oriented technique. Few techniques and their implementation plan are discussed in this paper.

**Key Words:** Color based sorting, TCS3200 color sensor, ultrasonic sensor, servo motor, Oranges, Arduino Nano.

## 1. INTRODUCTION

Now a day's farmer wants high accuracy and performance in their product like Orange sorting. Color and Size is one of the best parameters on which we can sort different colorful Oranges at marketing and industry level. Color and size are the most important features for accurate classification and sorting of Oranges fruits. When the Orange sorting situation where human work repeatedly and contains the same process, every cycle has an ability to give uneven result. In the future the wide range of that kind of application can be improved by using the robot. A robot work gives the effective result rather than human work. Robot can work day and night, compared to humans who need sleep and breaks. One kind of task of task which a robot would be able to perform is sorting colorful oranges. Into the categories for instance by color, shape or size. This is however, in this paper a review is done on color soring technique.

## 2. MOTIVATION

Robot is technology that deal with the design, construction and operation of robots that are used in numerous applications is called robotics. Robot is a modern machinery as they make life easier. With this fascination it motivated us to work on this project, building and programming a Oranges sorting system. To learn and attain knowledge that drives us towards this field of study our projects.

## 3. LITERATURE SURVEY

This content presents the critical analysis of the existing literature which is relevant to the Orange sorting system. Though, the literature consists of a lot many research contributions, but here, we have analyses some of the

research and review papers. Finally, the finding of summarized data to related the scanned and analyzed research papers.

Snehal Shirgave [1] in their paper explain about color sorting robot. This system consists of color sensor module, servo motor, Arduino UNO and LCD display. TCS3200 is the color sensor which detect light reflected light by an object and convert it into frequency. Servo motor are used to move a slider according to the color detected. Input and output operations are controlled by an Arduino UNO microcontroller. Detected output color and the count value of respective colored Object is displayed on LCD.

Rudresh.H. G and Prof. Shubha.P [2] this paper stated that the project deal with an automatic material handling system. This project purposed organizing the colored object which are approaching on the conveyor by picking and placing the objects in its separate located place. There by reducing the tedious work done human accomplishing accuracy and rapidity in the work. The project includes color sensors that senses the object color and lead the signal to the controller guides signal to the motor driving circuit which drives the different motor of the robotic arm to understand the object and place it in the correct location. Depending upon the colored sensed the robotic arm goes to the correct location to releases the object and come back to the initial position.

Real Time Industrial Color Shape and Size Detection System Using Signal Board by Geda. Karthik Kumar and S. Kayalvizhi [3] in their paper introduce a project about the detection of color, shape and size of various object at real time. The design of system is accomplished using a raspberry pi as a system of an chip, along with camera, display unit and mechanism such as conveyor belt use for the transport of object in the industrial environment. The main purpose of design of this particular system is to identify the color, shape and size as well as the number of objects moving with the help of conveyor belt.

Tushar G. Gaikar and his team [4] in their paper stated that the complete architecture of object sorting using color sensor and Arduino. Color sensor detect the color and gives serial output of RGB value to the Arduino microcontroller. Microcontroller read that value and decide color and gives output the voice recorder as well as LCD to display the color. Voice recorder record the color name and after getting

command from microcontroller it generates audio output through speaker.

Akriti Kaushik and Aastha Sharama [5] in their paper explain about color sensor. Color sensor register stuff by contrast, true color, or clear index. True color sensors are based on the one of the color models, most commonly the RGB model (red, green, blue). A large percentage of the visible color can be created using these three-primary colors. In this paper will be focusing on the application of color sensor using conveyor system for sorting RGB color.

[www.rapidtables.com/web/color/RGB\\_Color.html](http://www.rapidtables.com/web/color/RGB_Color.html) [6] in this website stated that RGB color space or RGB color system construct all the color from the combination of the Red, Green, and Blue colors. The red, green, and blue use 8 bit each, which have integer value from 0 to 225.

This makes  $256 * 256 * 256 = 16777216$  possible colors. RGB= Red, Green, Blue

**RGB color format & calculation**

**RGB code has 24-bit format (bit 0....23):**

RED	GREEN	BLUE
23 ↔ 16	15 ↔ 8	7 ↔ 0

$$RGB = (R * 65536) + (G * 256) + B$$

**(When R is RED. G is GREEN and B is BLUE)**

Automated color sensor system using LDR and RGB LEDS controlled using Arduino by Ahmad Amhani and Zaki Iqbal [7] in their stated that to create a color sensor system that has the good efficiency and low cost. The system is developed to detect ten different colors and differentiate between them. It has been implemented as a breadboard using LEDs, an LDR, Op Amps and an Arduino UNO. This paper will be explaining the component, working principal, connection, calculation, result and the errors.

Fayaz Shahdib & his team [8] propose another way of obstacle detection and object measurement using sensor. Sensor fusion is particularly applicable for movable robots for object detection and navigation. The technique that have been developed so far for detecting an obstacle are costly. Hence this paper proposed a new technique which can detect an obstacle, judge its distance and measure the size of the obstacle using one camera and one ultrasonic sensor. The technique is cheap in term of sensor cost and in term of computational cost.

In the paper of color sensor-based object sorting robot using embedded system [9] is information that to sort color object with a robotic arm. They have a robotic arm which picks different colored cubes and sorts them placing in different

cups. The detection of the particular color is done by a to frequency converter and light intensity method. The robotic is controlled by a microcontroller-based system which controls DC servo motor.

Kunhimohammad C. K, [10] in their paper states that a working prototype designed for automatic sorting of object based on the color. TCS230 sensor was used to detect the color of the product and the PIC16F628 microcontroller was used to controlled the overall process. The identification of the color based on the frequency analysis of the output of TCS230 sensor.

**4. CONCLUSION**

This paper provides survey on various techniques involved on color sorting and shape and size detection system. Variety of literature is available for the study of size, shape and color-based sorting technique. A few strategies between in this paper which are selected on the basis of implementation technologies used. This paper support for understanding the essential needs for designing color sorting, shape and size detection robot and planning its implementation strategies.

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- [W2] <https://howtomechatronics.com>
- [W3] <https://robokits.co.in/sensors/color-sensor/tcs3200-based-color-sensor-module>