Color Sorting and Pick Place Robot

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Abstract: The design, development and performance evaluation of the automated fruit sorting machine was carried out using an embedded system (Arduino based) to serve as a time saving, low energy consuming and cost effective alternative for sorting and grading fruit for both home and commercial applications. The device is constructed to sort different varieties of fruit, which includes mango, orange, lemon, apple, tomato etc. Sorting are carried out based on the difference in the wavelength of the color of a ripe fruit to that of an unripe or defective. This are made possible by the use of color detection module TCS3200, an open source operating system interfaced with an android remote application and a mechanical Robotic ARM system. In the end, the test result shows that the machine system has a 90% accuracy for sorting fruits that are either ripe or unripe/defective. Hence, this paper will provide the needed guidance for color error detection for fruit sorting and play a significant role in quality assurance and process automation.

Keywords: Arduino controller, Color sensor TCS3200, Robotic ARM, Reduction time.

I. INTRODUCTION

Now a day’s industry wants high accuracy and performance in their products. Color is one of the parameter on which we can sort different objects at industry level. The speed of color sorting process by an operator is very slow. This is due to the limitation of response time for a human eye. The eye will always take some time to see an image and project this to the brain to initiate visual sensation. After the brain has received the image, it will take some time for the brain to determine the color of the object too. However, this limitation can be covered by using a computer. In this project, a Arduino uno microcontroller is used to increase the speed of color sorting. The accuracy of color sorting process by an operator is very slow. This is because an operator will need to handle hundred or thousand of object each day, they will feel boring and their eyes are tired after a long day working. It was a very common case for an operator to give wrong result. However, a machine will not have this problem. A machine will give accurate result even after it has repeated a process for billions of times. In this project, a Arduino uno microcontroller was used to substitute the operator and thus increase the accuracy Of color sorting

II. Objectives of developed work:

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 sorting system. To learn and attain knowledge that drives us towards this field of study.
III. BLOCK DIAGRAM

The above flow chart shows the working flow of this developed system & the detailed information about these steps is given below in the methodology of this system.
1. place the object.
2. detect by IR sensor.
3. conveyor belt start.
4. color detected by color sensor.
5. stop after 3 sec
6. pick this object by robotic arm and place at particular position

V. RESULT:

Fig.1. color sorting with robotic arm machine

Fig.2. when object placed
Fig.3. display green color

Fig.4. display red color
Fig.5. display blue color

Fig.6. pick and place by robotic arm

VI. CONCLUSION:

Fully functional sorter machine can be implemented by using a structure of parallel and independent channels in order to increase the overall throughput which results with a forecasted performance. The project can work successfully and separates different objects using sensors. The sensor handling systems which drive the pick and place robot to pick up the object and place it into its designated place can work if accurately designed. There are two main steps in sensing part, objects detection and recognition. The system can successfully perform handling station task, namely pick and place mechanism with help of sensor. Thus a cost effective Mechatronics system can be designed using the simplest concepts and efficient result can be observed.

FUTURE SCOPE:

Color sorters (sometimes called optical sorters, color sorters, color sorting machine) are machines that are widely used on the production lines in food processing and many other different industries.

Color Sorters are using the advanced technology in food processing such as wheat, rice, grains, corn, peanut, different kinds of beans, sesame seeds, etc.

Color sorters separate particles based on colors and often used at the end of the processing line, to remove impurities of similar size and density after mechanical separations.
REFERENCES:


