IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Review On Colour Based Sorting System Using Conveyer Belt

Dr.Harish Harsurkar[1],Shridhar Deshpande[2], Rohit Kushwaha[3], Shailesh Naik[4], Suraj Chavan[5]

[1]HOD Mechanical Engineering Vidya Prasarini Sabha's College of Engineering and Technology ,Lonavala

[2]Asst.Professor Mechanical Engineering Vidya Prasarini Sabha's College of Engineering and Technology ,Lonavala

[3]Student Mechanical Engineering Vidya Prasarini Sabha's College of Engineering and Technology ,Lonavala

[4]Student Mechanical Engineering Vidya Prasarini Sabha's College of Engineering and Technology ,Lonavala

[5]Student Mechanical Engineering Vidya Prasarini Sabha's College of Engineering and Technology ,Lonavala

Abstract

The process of arranging items systematically is named sorting. Manual sorting of Object is preferred at the wholesale market and industries supported different parameters like size, shape, quality, etc. But it's a time consuming, less efficient, and inconsistent method. The existing systems in the market can sort single Object with single or multiple parameters. To replace this traditional sorting way, the proposed system presents an automatic Object sorting mechanism with ir sensor. It recognizes and classifies two different Object with two different heights analysis method.

In recent years the importance of process automation has been increased as the growth of any industry is directly depends on it. For precise output and accuracy of industrial process robots with sophisticated sensors are used. In modern era application of image processing in many industrial processes has proven its prevalence and dominance. This paper present color based object sorting system which uses the machine

vision and the operations in image processing. The proposed work is to develop compact, easy and accurate objects sorting machine using real time color image processing method to continuously evaluate and inspect the color deformity using camera based machine vision. After the evaluation of quality the object is sorted into predefined quality groups with the help of pick and place roboarm. If the inspected object fails to follow quality norms it is rejected out by the system. The proposed system will have broad areas of applications in many fields where continuously evaluation of the quality is required.

Keywords:Conveyer Belt, Roboarm, Monetary, Image processing, Arduino, IR sensor, blower,magnetic, biodegradable ,non-biodegradable

1.INTRODUCTION

At today's date quality of product, color, size, and so on not possible to sort on the same line traditionally.it is in the nature of humans to make mistakes. however, a company or factories may experience significant monetary losses due to human error, due to the variability of products being produced. however, it often fails to produce the desired result, and training is only responsible for about 10% of the human errors that occur. This is because it only takes care of issues related to lack of knowledge, skills, or ability. Image processing is the process of converting an image to digital form and then performing operations on it to create a better image or extract important information.in this the input is in the form of the image captured from the camera and output is some information extracted from the image. In this project, a low-cost automation system will be developed as a part of an industrial project for sorting the projects according to their colors the project mainly focused on sorting 3 different color objects using image processing.

IR sensor and DC motor interfaced with Arduino to sort the products. the system consists of a conveyor belt that takes the object in front of the camera and thus sorting is decided by Arduino. It is designed such that it will classify and distribute objects through a conveyor belt towards the dispatch section and it will check the object based on the color, if it is found green color then the conveyor belt will move continuously otherwise it will stop and the object will be passed to basket. To do so we are using Arduino, conveyor belt, sensor, and motor. as the signal is applied to the conveyor belt through Arduino it starts moving, then the web camera will detect the object and stop the conveyor belt. The camera clicks the image of the object and checks the color of the object. If the color of the object is red then it will command the conveyor belt to move right otherwise it will move straight forward, and if the color of an object is yellow then it will command the conveyor belt to move left otherwise it moves straight forward.

2.OBJECTIVES OF STUDY

To integrate color recognizing, sorting, and motor with a microcontroller. to check the code and troubleshoot with the efficiency of the system. To sort objects consistent with their respective colors and stations accordingly. This project purposed to automate the sorting process of products within the industries that supported their colors. additionally, it aimed to automate the tactic of sorting products to eliminate human errors in sorting products and hence the manual effort, time consumed and avoids danger which happed when humans add dangerous places. Moreover, the project aimed to develop this system with long durability, low cost, less maintenance, and inspect to make this system as user- friendly as possible. Therefore, color object sorting systems are going to be developed by using image processing and Arduino which can serve the factories with the assembly of top quality and accurate products which will raise the reputation of the company and may also provide customers satisfactory products.

3.PROBLEM STATEMENT

A robot's work gives the same result each time as opposed to the human. When the robot is programmed, it will do the exact same operations every time. Further advantages of using a robot are the decreased time consumption. The quality and capability to repeat precise movements makes it easy to increase the speed of the process.

4.LITERATURE REVIEW

1. **Rahul Rajendra Pai.** his paper includes designing and developing a device which can segregate dry wastes with no human intervention. They have told the importance of segregating the household waste at root level.The components used for their design in this paper are shredder,blower,magnetic drum. The result or last declaration of authors was they have no known competing financial interest or personal relationships that would have appeared to influence the work reported in this paper.

2 .**Ahmad Sahru Ramadhan** this paper includes research on automatic waste sorter machine using proximity sensor.The system designed in this include components like Capacitive proximity sensor,Inductive proximity sensor,Microcontroller,PIR sensor ,Utltasonic sensor,Waste sorter machine. The conclusion of this paper was that the machine can detect waste entering the trash according to its type and there is error of detection of 28%.

3.**Nitmisha S Gupta** this paper includes design of automatic waste machine which detects wet,etc. This system is designed in way that it collects from different positions and segregates. The components used in the

system are metal detection system ,capactive sensing module,IR transmitter,IR receiver,etc.The system is also going to detect segregate biodegradable ,non-biodegradable and metals,etc.by using sensors.

4.**M.Rajeshwari** this paper includes the study about automatic waste segregator.The proposed system consists of different sensors,Aurdino UNO,etc for segregation system.The system proposed system now segeegates only metal,glass,wet and solid. Also the proposed system includes sensors for when then bins are full at certain level.

5. Seeram Srinivasa Rao this paper is about design and analysis of waste segregation Mechatronic system. Also it includes mechatronic system for separation different types of waste materials and recycled materials monitoring information details directly settle to the recycling plant.

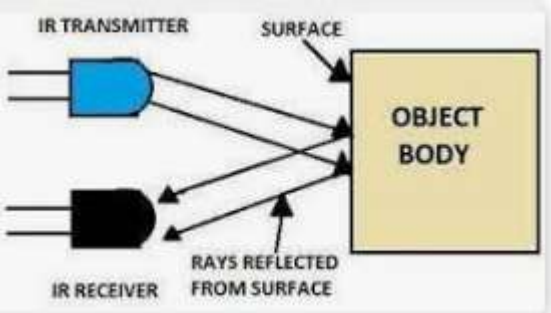
6. **Myra G.flores** this paper is about automatic waste segregation system using machine learning. In this paper they have explained the new technologies like AI, etc .They have also used different algorithms. The materials they have used are infrared obstacle line sensor, AI sorting techniques, Aurdino UNO board ,ultrasonic sensor, etc .Shortcoming of these was that they detect only one element at a time.

7. **Mohammed Sahad MT** this paper includes information about automatic waste segregator and monitoring system. The system was basically used for household the waste collected is reused and recycled properly in this proposed system. The system backlog is that it can only segregator one item at a time.

8. **M.K. Pushpa** this paper provides information about microcontroller based automatic waste segregator .This system includes different sensors ,conveyer belt, blower etc. There were certain limitations like sizes consumes time. Metals get attached permanent magnets.

BLOCK DIAGRAM

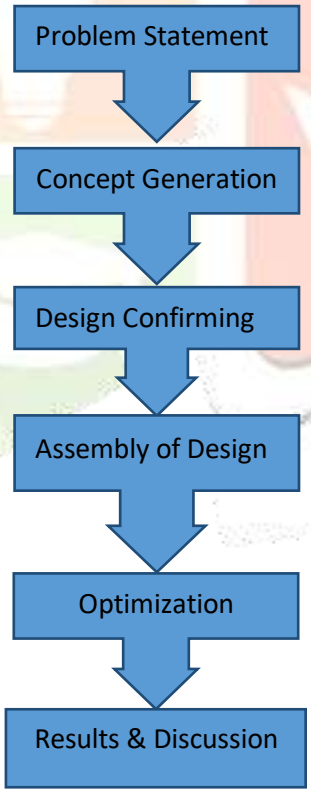
WORKING OF IR SENSOR



5.METHODOLOGY

The Automatic Segregator System is driven by the Microcontroller Raspberry pi. All the components that are connected to Raspberry pi are programmed. The program reads the input/output pins of the components. The conveyor belt system moves when it senses the garbage. The servo motors are present to deflect the metallic ,non-metallic, glass, plastic waste into the specific bins. The metallic waste is detected by Inductive Proximity sensors. The dry waste has paper and plastic which are differentiated using the Capacitive Proximity sensor. The plastic bottle waste is detected by the image sensing camera. Glass waste is segregated by Photoelectric sensor An inductive proximity sensor based on the eddy current principle suitable for metallic targets has been used. Dustbins are placed below. Once the type of the waste is detected through the respective sensors ,the gate gets closed and falls into the bin.

The Proposed Method is a solution to the current waste management analysis problem which will effectively segregate metal, non-metal, glass, plastic.



Methodology of working process

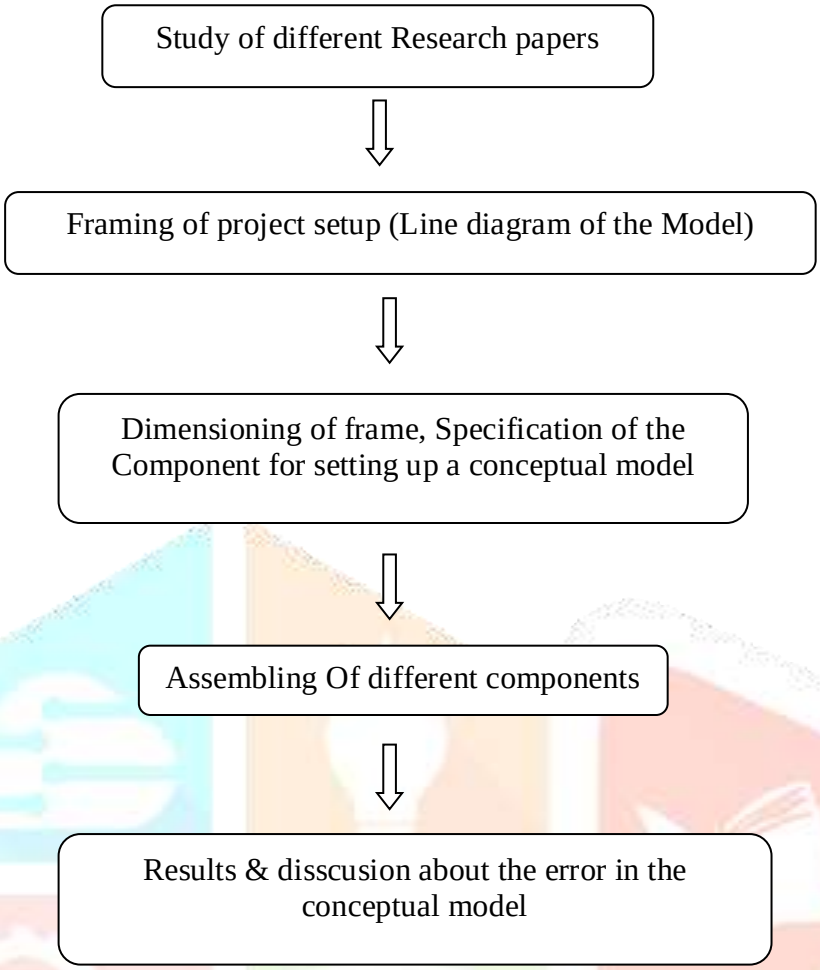


Fig. 1 Flow Chart For Working Process

COCNLUSION

The proposed system "automatic waste segregator and monitoring system" sorts wastes into three different categories, namely metallic, non-metallic, Glass, Plastic bottle. Wet waste refers to organic waste such as vegetable peels, left-over food etc. Separating our waste is essential as the amount of waste being generated today causes immense problem. Here, we have tested the household wastes which are generated in every home today.

FUTURE SCOPE

i. Improving the sensor system identification speed of the different waste materials with new techniques.
ii. Improving the robotic arm speed for pick and place different waste materials.
iii. decreases the cost of devices with reduce the total system size and weight and changing the parts of the equipment.
iv. In different places different non-biodegradable waste materials produced highly. So, changing the new equipment designs like add robotic arms for pick and place.

REFRENCES

1. Adhrisya, Aiswarya, Ambili, Veena Mohan, Jancy, “Centralized Waste Segregation System”, IJSRD Volume 4,Issue 01,2016
2. Kumar, N. S., Vuayalakshmi, B., Prarthana, R. J., & Shankar, A. (2016). IoT smart garbage alert system using Arduino UNO. 2016 IEEE Region 10 Conference (TENCON).
3. Chetna Kaushal, Anshu Singla "Architecture for garbage Monitoring System using Integrated Technology"15 September 2020
4. Padmakshi Venkateshwara Rao, Pathan Mohammed Abdul Ages “IoT based waste management for smart cities” International conference on computer communication and information (ICCCI), Coimbatore, India, Jan22-24,2020
5. Nikolaos Baras, Dimitris Ziouzios “A cloud based smart recycling bin for in-house waste classification” in the 2nd International Conference on Electrical, Communication and Computer Engineering, Istanbul Turkey June 12-13 2020
6. Shashank Shetty, Sanket Salvi "SAF-Sutra: A prototype of Remote Smart Waste Segregation and Garbage Level Monitoring System" International Conference Communication and Signal Processing, India, July 28-30, 2020.
7. Rania Rizki Raina, Dominica’s Bolin Watomakin “Improve Smart waste Management to Preserve Tourist Attraction Yogyakarta in IoT Environment” International Conference on Smart Technology and applications (ICoSTA), 2020.