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RGB COLOR SORTING USING IMAGE PROCESSING AND ARDUINO

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ABSTRACT

The main work that needs to be completed at the final dispatch section in many packaging industries is the counting and sorting of colored objects. The traditional method preferred by industries for sorting typically involves manual sorting. This process entails human operators conducting visual inspections and categorizing items based on predetermined criteria. This conventional method is laborious, time-consuming, sluggish, and inconsistent. As a result, efforts are undertaken to develop and implement an automated method for identifying an object's color, as well as for counting and categorizing objects based on their color using image processing. The most frequent attribute used to distinguish between objects, categorize them, identify them, and keep track of them is color.

success present day environment of competitive manufacturing in the commercial zone. some action on the physical requirements.

There is a strong likelihood that there will be extreme confusion and that the finished result will be subpar if items or parts in industries are not properly categorized.

LITERATURE SURVEY

Manoj Ravindra Fegade, Gurpreet Singh Bhatt,

INTRODUCTION

The sorting of products in industrial processes can be challenging, especially when relying solely on manual sorting. Continuous manual sorting can lead to inconsistencies and errors. To address this issue, a project has been developed that

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focuses on automating the sorting process using color as the criterion. The project involves a working prototype that utilizes Arduino Uno and MATLAB to control the overall sorting process. By implementing this automated system, the aim is to improve sorting accuracy and efficiency while reducing the reliance on manual labor.

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Machines excel at performing highly repetitive tasks compared to individuals. The weaknesses of workers on assembly lines can lead to decreased performance and pose challenges in maintaining product quality. Specifically, workers who frequently engage in inspection tasks may gradually experience a decline in their ability to accurately recognize product colors. This decline in color recognition capacity can hurt the overall quality of the sorting process. Automating a lot of tasks in numerous industries can improve the effectiveness of the manufacturing system. This plan aims to design and execute a system that intelligently groups goods according to shade. This gadget is made up of a conveyor belt, a color sensor, a DC motor, a servo motor, an Arduino Uno, and MATLAB software. Manufacturing performance is a key factor in

EXISTING SYSTEM

There are many pixels in an image, and each pixel has a unique code. These codes are added together to produce a full image. Following analysis, these codes can be utilized to define colors, and those defined colors are then used. for pixel labeling, which is used to identify the colors in the image.

The objects in the current system are sorted manually, primarily by humans. Because of this, there is a greater chance that human error will be taken into consideration and the work will be incorrect.

PROPOSED SYSTEM

This design employs a straightforward and reasonably cost-effective method for classifying the constituent parts of objects with distinctive colors. It distinguishes between the various colored devices by remotely sensing the color of the thing. Using Matlab here we are detecting the object and separating them based on their color.

Fig: Block Diagram

DESIGN OF THE SYSTEM

The design of the system includes:

1) Arduino Uno: According to its data sheet, The Arduino Uno is a microcontroller board with an ATmega328 processor. Six analog inputs, a 16 MHz crystal oscillator, a USB port, a power connection, an ICSP header, and a button to reset are all incorporated in the device's assortment of parts. There are also 14 digital input and output pins available, with six of them capable of functioning as PWM (Pulse Width Modulation) outputs. These features collectively enhance the functionality and versatility of the device, enabling users to interface with various analog and digital systems and utilize PWM for precise control over specific outputs. Arduino IDE: Arduino is a user-friendly hardware and software platform for experimenting that is open-source. An Arduino board may operate a motor, a chip with an LED, or whatever online by analyzing inputs like a light on a sensor, a user hitting a physical button, or a tweet being sent.

2) MATLAB: A full environment for mathematical computing and a fourth-generation computer language, MATLAB is also known as matrix laboratory. It is a product of MathWorks., is a versatile programming language that enables a wide range of capabilities. It allows for matrix manipulation, facilitates the implementation of algorithms, supports function and data visualization, and provides tools for user interface design. Additionally, MATLAB enables effortless interaction with software created in other programming languages, including C#, Java, C, Fortran, and Python. This set of features makes MATLAB a powerful and exclusive programming language with extensive applications in various domains.

3) A liquid crystal display (LCD) is a form of flat-panel monitor that utilizes liquid crystals to produce visual output. that generates visual output using the characteristics of liquid crystals. LCDs find extensive use in various electronic devices such as smartphones, televisions, computer displays, instrument panels, and more. This broad utilization makes LCDs highly versatile and applicable in both consumer and

enterprise settings. With their ability to provide high-quality visual output, LCDs have become an integral part of modern technology, enhancing user experiences and enabling a wide range of applications across different industries. Servomotor: A servomotor, sometimes referred to as an actuator, A device that allows for accurate manipulation of angular or linear position, velocity, and acceleration is known as a precision motion control system..
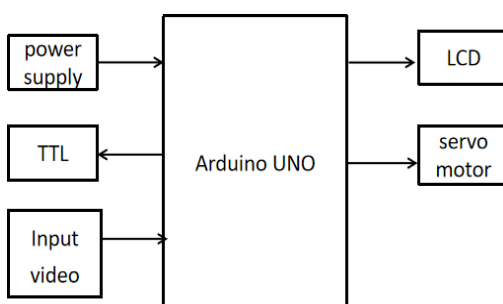
While servomotors are commonly referred to as a specific type of motor, it is important to note that the term "servomotor" does not represent a distinct motor classification.
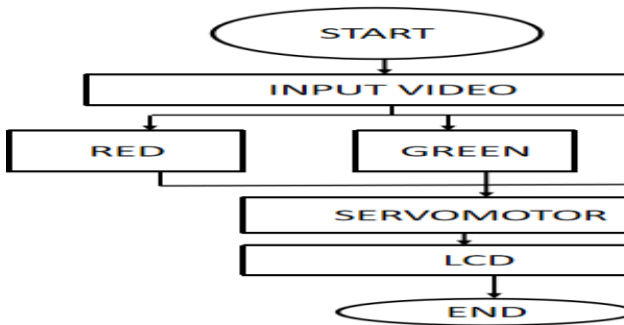

Fig: Flow Chart

TECHNOLOGY USED

A) Why Matlab instead of VB?

This language makes it simple to write code. Compared to Visual, Matlab provides greater functionality. In comparison to Visual Matlab, this language is far better at parallelism, has a better library distribution system, and is much more appropriate for real-time applications. Matlab has a large number of pre-written routines that reduce the complexity and time required for coding.

Fig: Matlab Software

ADVANTAGES OF MATLAB

1. Matlab is a user-friendly programming language that offers an accessible and intuitive learning experience.
2. Codes written in this language are frequently very trustworthy.
3. Matlab is a great tool for scientific and numerical computation.
4. Matrices serve as the fundamental data component in
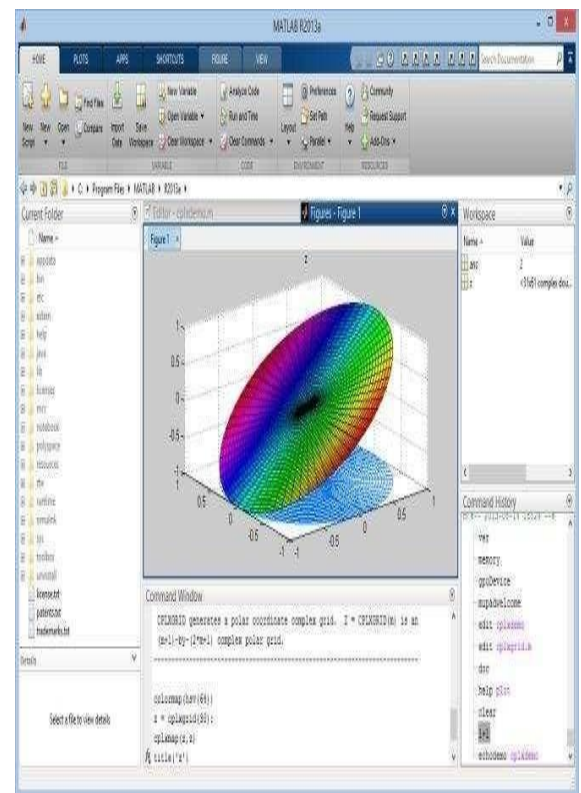
Matlab. Even a simple number is treated as a matrix in Matlab, with a one-row and one-column structure. operations that use vectors.

5. The graphic output has been designed with interactivity in mind.
6. By including toolboxes, Matlab's capability can be considerably increased.
7. An enormous database of integrated algorithms for image processing and computer vision applications isavailable.
8. You can test algorithms right now with MATLAB without having to recompile them.
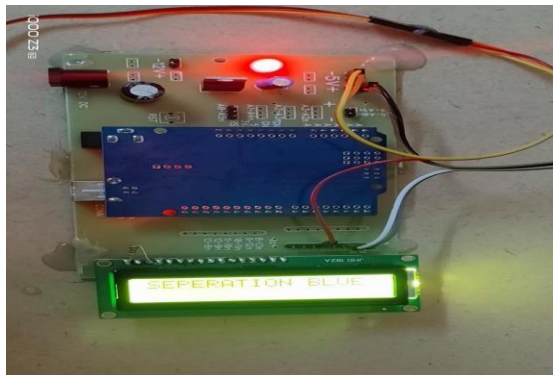
RESULTS

Fig: Hardware implementation of the RGB color sorting system

In several industrial and processing businesses, "RGB color sorting using image processing and Arduino" aids in classifying products according to their color.

CONCLUSION

The implementation of automation in an automatic technique for determining an object's color, object count, and object sorting based on color using an image processing approach led to several conclusions drawn from the results obtained through the application of algorithms in the prototype system design. A method for counting objects, determining their counts, and classifying them has been

developed. Purely red, green, and blue-colored items

produce accurate results using the implemented system. This method can be utilized for several colors of basic specifications with some program tweaks.

Manual efforts are decreased as a result of the use of automation in the color identification and count calculation processes, which improves accuracy and saves money. The items are separated based on color and placed into the appropriate bins. The application of MATLAB to color identification Because sorting objects is a straightforward operation, it requires less manual labor to count and sort the items. Accuracy increases as a result, and time and money are also saved.

FUTURE SCOPE

Various aspects of the proposed project are frequently improved. By using a more potent microprocessor, the sorting mechanism is frequently made to operate more quickly. To identify objects with numerous colors and shapes, more complicated image processing is sometimes used.

REFERENCES

[1] Sahil Singhal, Vishesh Goel, and in particular, "color detection in images using RGB modeling in MATLAB" Silica Kole, Arun Jain March 2017 issue of the International Journal of Computer Applications (0975-88887), volume 161 no. 8.

[2] Himanshu Patel, IOT Colour-Based Object Sorting Machine, Riya Joy both Selin Macwan and Selin Modi. ISSN 0973-4562 International Journal of Applied Engineering Research, Volume 13, Number 10 (2018), Pages 7383–7387 Published by Research India. http://www.ripublication.com

[3] "Colour-Based Object Sorting Machine" by V.A. Ahere andMayur Dukre Ganesh Abhang, the throat of Trupti. e-ISSN: 2395-0056 Volume: 08 Issue: 02 | February 2021 www.irjet.net p-ISSN: 2395-0072 International Research Journal ofEngineering and Technology

[4] "Fruit Quality Management and Sorting System", ISSN: 2348-4098, Volume 3, Issue 2, 2015. Devendra A. Itole, Madhura R. Lodam, Sneha N. Panse, and Vaishnavi S. Kulkarni [5]Fruit Quality Measurement System, International Journal of Research in Advent Technology, Vol. 3, No. 5, May 2015, E- ISSN: 2321-9637, Mr.M.V. N., R.P. Kumar, Mr. AshutoshKumar, Ms. Narale P.T., Ms. Patil A.V., and Ms. Mulani S.I.

[6] Rahul Vijay Soans, Pradyumna G.R., and Yohei Fukumizu, "Object Sorting Using Image Processing," Conference Paper, May 2018, DOI: 10.1109/RTEICT42901.2018.9012110.

[7] Ranjith, Chandra Singh, Abhilash Hegde, Rahul Vijay Soans, and Adithya Kumar, "Object Tracking Robot using Adaptive Colour Thresholding," International Conference on Electronics and Communication Systems (ICCES), 2017.