

Automation of colour Object Shorting Based on Conveyor Belt

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ABSTRACT

Sorting is the process of arranging two or more objects with similar but different characteristics into a systematic order. This is typically done manually or using automated sensors. Proposed here uses an Arduino UNO to detect the presence of objects and their colours, allowing only objects of the desired colour to pass through the conveyor belt, and deselecting objects of unpleasant colours. is a highly automated system. Belt from there . If the colour is not desired, passing a high signal on the activates the linear actuator, repelling the object and deselecting the object. This is done using the "C" code that the Arduino UNO supports.

Keywords - Automation, Classification, Colour Sensors, Microcontrollers

INTRODUCTION

Today, the industry is moving towards using colour sensors to meet the demand for higher productivity and precise quality. Until now, the components used for colour detection were thought to be expensive and required precision support circuitry, which has largely limited their use to specialized equipment. However, new colour sensor

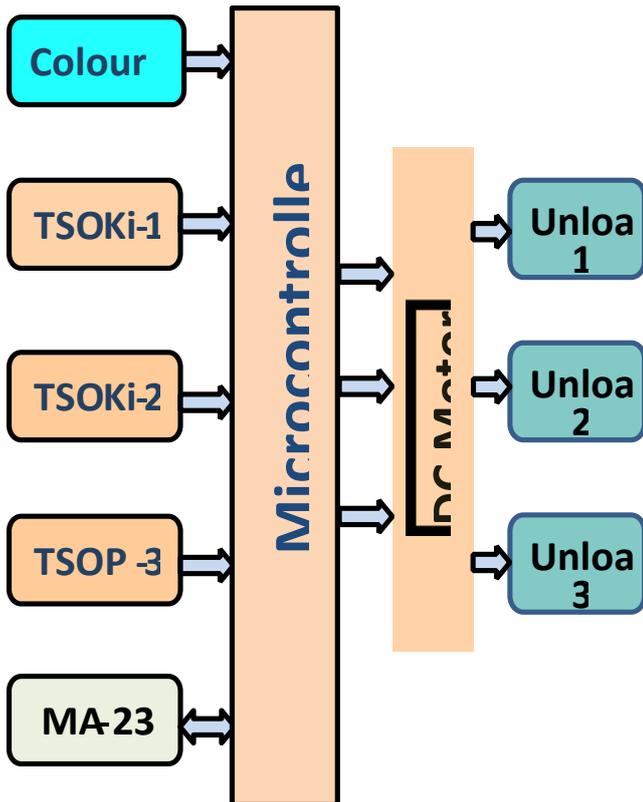
technologies with higher levels of Integration are becoming available, enabling more cost-effective solutions. As the cost of colour recognition decreases, the number of colour cognition applications will increase. Colour sensors play an important role in end devices such as colour monitor calibration, colour printers and plotters, paint, textile, and cosmetic manufacturing, and medical applications such as blood diagnostics, urinalysis, and dental matching. The complexity of a colour sensor system is highly dependent on the number of wavelength bands or signal channels used for colour discrimination.

METHODOLOGY

On certain block diagrams, objects are sorted by colour. A colour sensor is used to detect the colour of an object. The Arduino UNO is used as a control device to make correct decision and perform various activities. When sorting objects, a mechanical mechanism is required to sort objects using servo motors and conveyor belts. First objects are classified based on their colour using a colour sensor. Detect the colour of objects and give the Arduino UNO a specific code number. The Arduino UNO compares the code with the stored

data and provides specific outputs related to the inputs. Finally, the controller commands the mechanical assembly to place the object at the specified location.

PROPOSED SYSTEM BLOCK DIAGRAM



LITERATURE SURVEY

Mohammad Moghadam Vahedi et al [2014], this paper describes the grading of dates based on different stages of maturity: halal, rotas and tamal, to meet consumer demand. The system consists of a transport unit, a lighting and detection unit and a sorting unit. Physical and mechanical features were extracted from the provided samples and detection algorithms were designed accordingly. To recognize date patterns, an index based on colour features was defined. Date palms were carried one

after another on a belt conveyor. When they were in the centre of the camera's field of view, snapshots were taken and the images were immediately processed to determine the maturity of the data. When the date passes a sensor located at the end of the conveyor, a signal is sent to an interface circuit that activates the appropriate actuator driven by a stepper motor, directing the date to the appropriate connector. To verify the performance of the proposed system, the entire sample was again visually classified by experts. The system's detection rate for Tamar and Karla was satisfactory. Although the Rotas level detection rate was poor, there was no significant difference between the accuracy of the system and that obtained by experts. Image processing system speed is 0.3seconds, system capacity is 15

Advantages

- a) Less material handling
- b) Maintain the quality of the product
- c) Consume less time, hence increase the production rate.
- d) Low Maintenance
- e) Solve all manual sorting problems
- f) Significantly reduce the number of manual workers in sorting plant Achieve high sorting speed

FUTURE SCOPE

- a) Using a timing belt and gears instead of a direct connection between the rollers and the motor shaft is more efficient. However, proper meshing of toothed belts and gear wheels requires attention.
- b) Some rubber grippers are available. Increase surface resistance to prevent conveyor belt slippage.
- c) Using the colour sensor TCS230 might make more sense. But it is not cost effective.
- d) Pneumatic actuators can be used to sort items and place them on different belts

Conclusion

In today's highly competitive manufacturing industry, managing the integrity of product delivery from raw materials to finished product through quality manufacturing is paramount. High quality and dimensional accuracy are absolutely necessary for product declaration. Therefore, this automatic colour classification project excels due to its working principle and wide range of implementations. By applying the ideas of this project, the industry can easily sort the products they need by colour. With some modifications, the concept can be implemented in a wide range of applications, albeit with some limitations.

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