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Weight based Object Shorting Automation System Using IoT based Application

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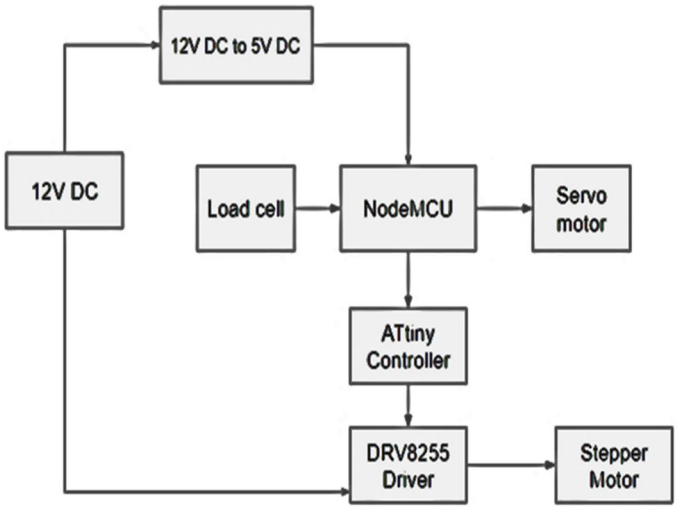
Abstract: ***Now a day's industrial area requires demand for automation. Due to automation human efforts are decreasing since last decade. Object sorting based on weight is difficult task in recent days. In industry there is rapidly increasing demand for automation. The Sorting of objects based on weight is very difficult task. This project gives us an idea about automatic colour sorting. Here we are designing and implementing an efficient sorting using laser sensor based on Arduino .This project gives high accuracy and performance. Easy to operate and construct which reduces human errors. Existing sorting method uses a set of inductive, capacitive and optical sensors do differentiate object based on weight.***

I. INTRODUCTION

Most of the industries have at least one conveyor system tomove or to separate the materials. The need to produce an automatic material separating conveyor is essential. Earlier many critics argued that automatic material separating system leads to failure, but due to the advancement of technology, reliable automatic system can be produced. Manual material separation system require more money, time and machines. It will lead to high cost. To reduce these wastage, many companies started to adopt automation in the plant. If the industries use automation, it helps to increase rate of production, with smart utilization of space at lesser / reasonable rates. This automatic material removing conveyor system separate the material depending on their height. It contains an Node mcu , IR sensor, Weight sensor, servo motors, liquid crystal display. Overall, the system helps to ease movement and add more visibility Sorting is necessary in industries where products are manufactured on large scale.

II. METHODOLOGY

This project work is for the food product manufacturing industry. Our project objective is to separate the 100 gms boxes sorting machine which reduces human efforts and increases company productivity. We are working for the issue and have to give one small demo prototype as per the company requirements. Here we are using load cell to measure the weight, for demo 100gms soap are accepted and below that are rejected. The servo motor use to rotate the selector plate after the conveyor belt for selected and rejected The data of counting is send to the cloud server as well as the conveyor motor start and stop time we can monitor online.



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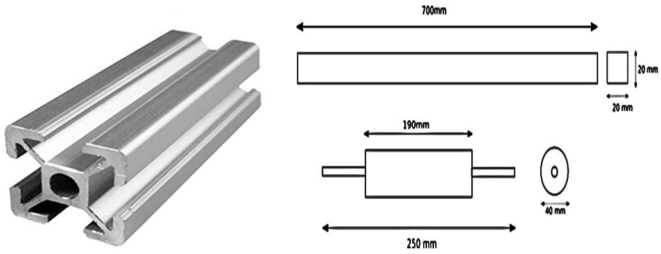
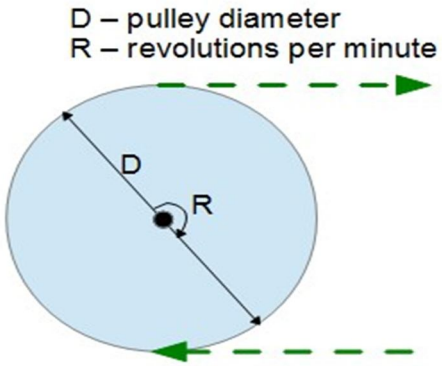


As shown in the diagram, NodeMCU is used as wifi controller, ATtiny85 microcontroller is used to run the stepper motor for conveyor belt after getting push button signal from nodemcu
IR sensor which sends signal to nodemcu to stop the servo motor when the soap is on the load cell, after getting the load cell value in grams if the soap is of 100gms then servo motor shaft rotate right side and soap will dispense on right side, if the soap is of below 100gms then servo motor shaft moves on left side so rejected soaps will dispense on left side DISCUSSION -In the previous paragraphs it has been shown how an IoT application for belt conveyor systems like the smart idler concept can be developed using the characteristics of IoT systems and Big Data. Although the concept has been developed, and still is under further development, it has not yet been implemented in a large-scale belt conveyor. The main reason is the worldwide situation of the mining industry. The smart idler concept has been tested extensively underlaboratory conditions in all kind of different configurations and the system works fine. The RFID sensor nodes in the meantime have been further developed to an economical viable concept.
However, in practice it is not always easy to convince the procurement department of a mine to invest in technology on forehand. Unexpected downtime of a largescale belt conveyor may costs up to $300,000.- If the idler rolls where the cause of this downtime then this could have been prevented by using the smart idler concept.

III. CALCULATIONS

The Speed of a Belt calculator computes the speed at which a linear length of belt travels around a pulley based on the diameter (D) of the pulley and the rotation rate (R).Belt
(D) Diameter of Pulley
(RPM) Rotation Rate



Belt Speed (BS): The calculator computes the belt speed in feet per second. However, this can be automatically converted to other velocity units via the pull-down menu.
The formula for the speed of the belt is:
BS = (D •π • R)/(2π) = ½•D•RPM where:
1) BS is the Belt Speed
2) D is the diameter of the pulley
3) RPM is the rotation rate (rpms) of the pulley
Here the D=2 and RPM = 30
So the conveyor belt speed is = 7.97 cm/sec

IV. LITERATURE SURVEY

1) Development of a lemon sorting system based on color International Journal : African Journal of Plant Science Vol. 4(4), pp. 122-127, April 2010, Author: M. Khojastehnazhand, M. Omid* and A. Tabatabaeefar
2) Automatic Material Sorting and Storing Machine using Arduino S.Siva Sai Kumar Reddy, R. Puviarasi. International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958, Volume-8 Issue-6S, August 2019

V. WORK

In this paper, an efficient algorithm for grading lemon fruits is developed and implemented in visual basic environment. The system consists of two CCD cameras, two capture cards, an appropriate lighting system, a personal computer and other mechanical parts. The algorithm initially extracts the fruit from the background. The samples of different grades of lemon are situated in front of the cameras and are

database. By comparing the information during sorting phase with the available information inside the database, the final grade of the passing fruits are determined 2] Orange Sorting by Applying Pattern Recognition on Colour Image nternational Conference on Information Security & Privacy (ICISP2015), 11-12 December 2015 Author: Jyoti Jhawar With an aim to replace the manual sorting system, this paper proposes the research work for automated grading of Oranges using pattern recognition techniques applied on a single color image of the fruit.

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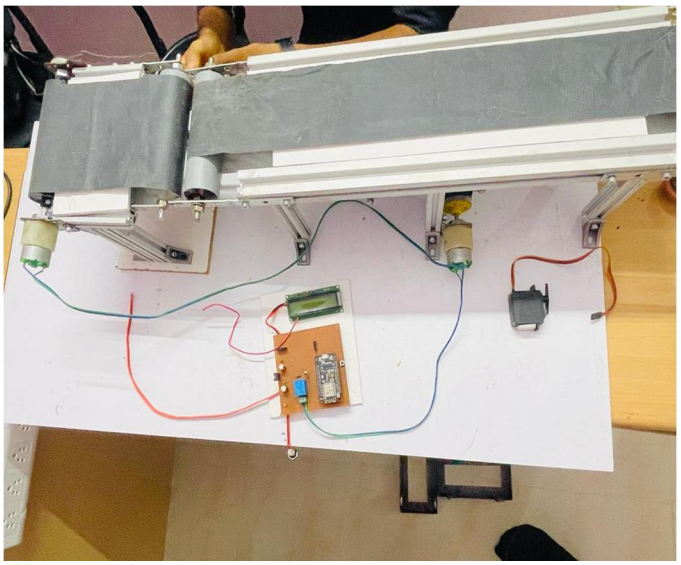

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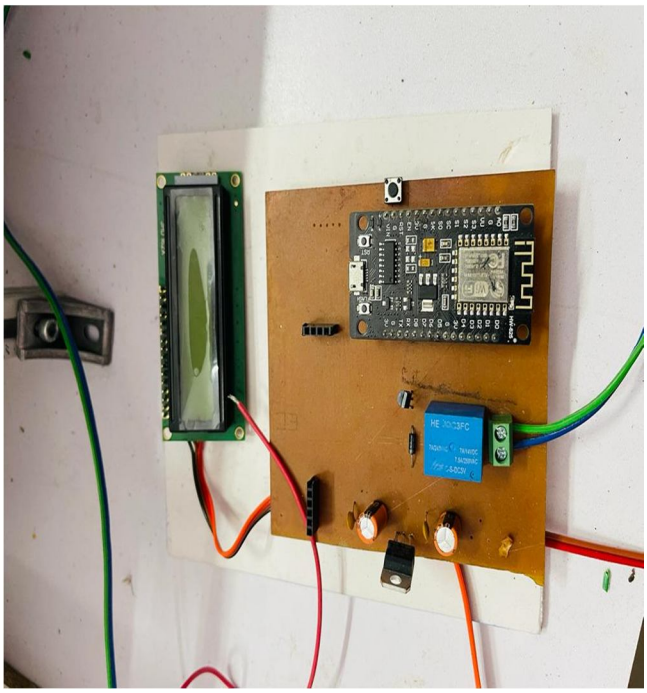
VII. APPLICATIONS

1) Home appliances
2) Home automation
3) Smart plugs and lights
4) Industrial wireless control
5) Baby monitors
6) IP cameras
7) Sensor networks
8) Wearable electronics
9) Wi-Fi location-aware devices
10) Security ID tags
11) Wi-Fi position system beacons



VIII. RESULT

As we have to design the sorting mechanism the expected result is to sort the object as per the weight parameter The quantity of the selected and rejected products will be monitor online on the website cloud server In the previous paragraphs it has been shown how an IoT application for belt conveyor systems like the smart idler concept can be developed using the characteristics of IoT systems and Big Data.

Although the concept has been developed, and still is under further development, it has not yet been implemented in a large-scale belt conveyor.

The main reason is the worldwide situation of the mining industry. The smart idler concept has been tested extensively under laboratory conditions in all kind of different configurations and the system works fine.

The RFID sensor nodes in the meantime have been further developed to an eco-nomical viable concept. However, in practice it is not always easy to convince the procurement department of a mine to invest in technology on forehand.

Unexpected downtime of a large-scale belt conveyor may cost up to $ 300,000. If the idler rolls where the cause of this downtime then this could have been prevented by using the smart idler concept.

The IoT application described in the previous paragraphs only concerned the idler rolls. There are however two other examples of a combination of the IoT and a BMHT system; a belt scraper system and the conveyor belt inspection system.

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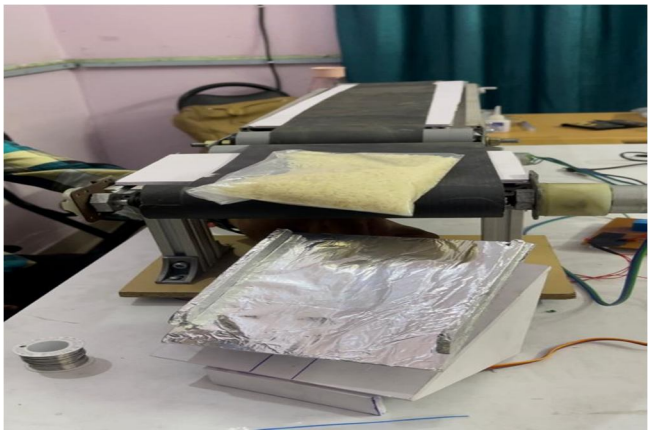

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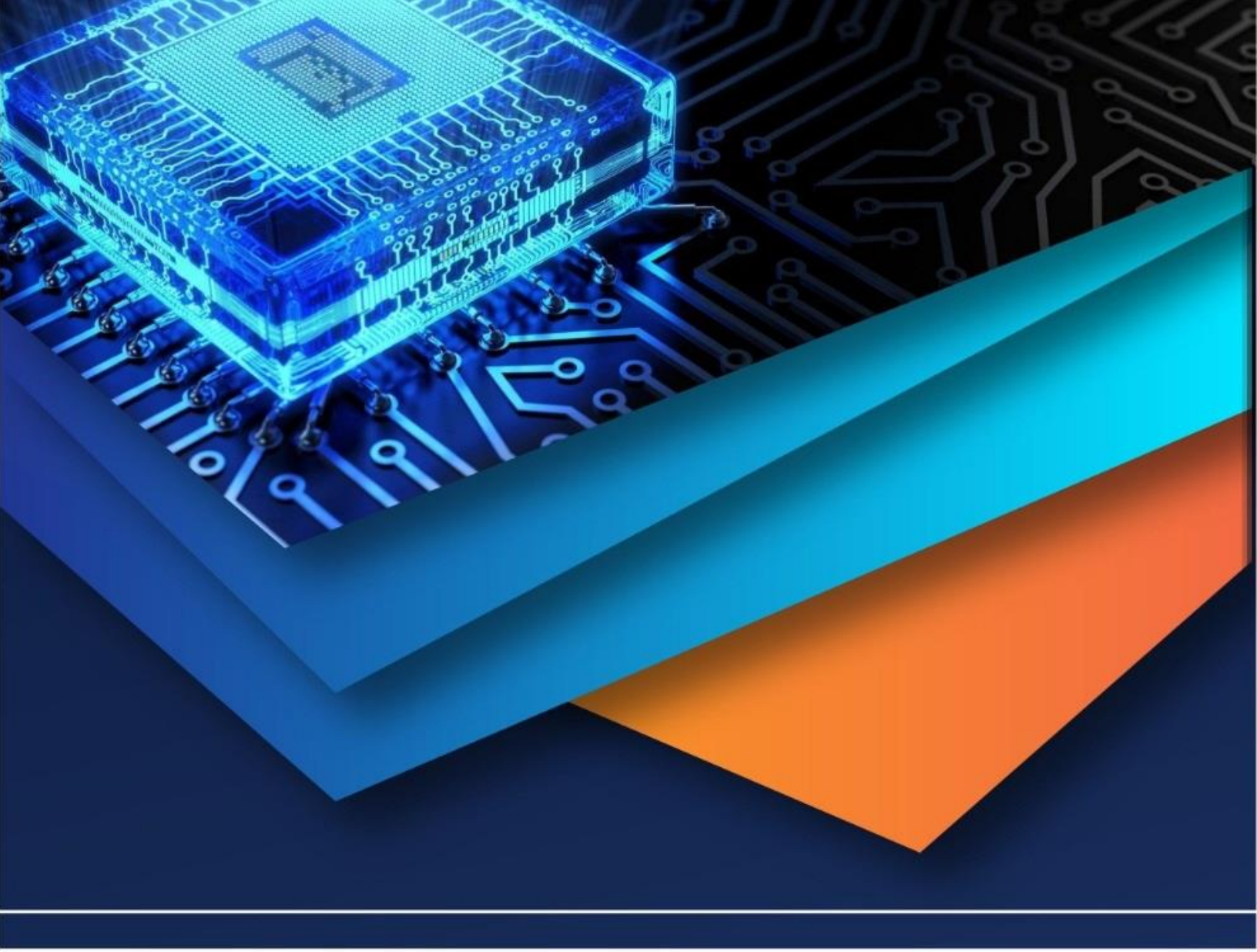

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