WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

SIZED BASED OBJECT SORTING CONVEYOR BELT AUTOMATION SYSTEM

Prof. Mr. Dinesh Dhwale[1], Rhutvik Pachghare[2], Nishikant Patil[2], Nida Sayyed[2], Prajyot Bagde[2], Tushar Raikohad[2]

[1]Professor, Department of Electrical Engineering (Electronics & Power), Priyadarshini college of Engineering, Nagpur, India
[2]Student, Department of Electrical Engineering (Electronics & Power), Priyadarshini college of Engineering, Nagpur, India

ABSTRACT

Now the industrial area of the day needs the need for automation. Because of automation human efforts have been declining since the last decade. Sorting items based on size is a difficult task in recent days. In the industry there is a growing need for automation. Sorting items based on color isa very difficult task. This project gives us an idea of the default color scheme. Here we design and apply effective filtering using an Arduino-based laser sensor. This project provides high accuracy and performance. Easy to use and build that minimizes human error. The existing filtering methoduses a set of inductive, capacitive, and optical sensors to distinguish an object based on size.

Keywords: *Arduino, Relay, Laser Diode, LDR Sensor, DC Geared Motor, Servo Motor, LCD.*

1. INTRODUCTION

Most industries have at least one transportation system for moving or sorting things. The need to produce an automated object that separates the conveyor is important. In the past many critics asserted that the automation system could lead to failure, but due to advances in technology, a reliable automation system could be developed. The process of separating handmade items requires extra money, time, and equipment. It will lead to higher costs. To reduce this waste, many companies started using automationin the industry. When industries use alternatives, it helps to increase productivity, through efficient use of space at low / reasonable prices. This automatic extraction system classifies objects according to theirlength. Contains Arduino, LDR sensor, servo motors, liquid crystal display. Overall, the system helps to simplify movement and add more visibility. Refining is needed in industries where products are produced on a large scale. This process is simplified automatically. This project is a project of the Karanja MIDC Food Production Industry known as "Shree Vinayaka Food Products" its lemon productsand Mango Pickle, Red chilli paste, Garlic & Ginger paste and exported to USA and Australia. Our project goal is to design a Pickle-based box filter and place it in a box for packaging. a filter that reducespeople's efforts and increases the company's productivity. We work for the food industry and must provide one small demo according to the needs of the company.

2. LITERATURE REVIEW

1. Development of lemon-based filtering system. International Journal: African Journal of Plant ScienceVol. 4 (4), pages 122-127, April 2010, Author: M. Khojastehnazhand, M. Omid * and A. Tabatabaeefar.

   Function: In this paper, an effective lemon fruit measuring algorithm is developed and applied to the basic visual area. The system consists of two CCD cameras, two photographic cards, a suitable lightingsystem, a personal computer, and other components. The algorithm starts to pull the fruit back. Samplesof different levels of lemon are placed in front of the cameras and are measured offline. Then information on HSI color values and a limited number of fruits are extracted and stored on the website. By comparingthe information during the filtering phase with the information available within the database, the final range of transient fruit is determined.

2. Orange Sorting Using Pattern Visibility in Color Image. International Conference on Information Security and Privacy (ICISP2015), 11-12 December 2015. Author: Jyoti Jhawar.

   With the aim of transforming the hand-crafting system, this paper proposes a research project on the automatic arrangement of oranges using pattern recognition techniques used in a single fruit color scheme. The study was conducted on 160 Orange fruit collected from various parts of Vidarbha districtin Maharashtra.

Automatic Scale & Packing Machine.

Low-cost automatic measurement and packing machine capable of performing measurement, bag fillingand bag removal operations with great efficiency is produced. The operation of this machine is easy andthe chances of an error in the calculation of weight are almost invisible. The use of time and effort required to measure manual and packaging is minimized. The process is completed in 3 steps. In the firststep, the input value is given; the asset value of the input value is extracted from the hopper to the appropriate. In this step, the rotating disk will act as a door and will open / close according to the input value. Weight calculation is done using a load cell sensor. The second step consists of a small vacuum pump that will increase the opening of the bag, so that the filling function will be comfortable. In the third step, using a conveyor belt, the bag will be shipped out of the machine. The only function the operator must perform is to provide the input value and collect the wallet after the procedure is performed.

Advanced Automated Filtration Machine and Calculator Using Arduino Nano Microcontroller and TCS3200 Color Sensor

Filtering products in the industry is a very difficult task and continuous manual filtering creates problems. It is highly desirable to build a detector and move them when the object meets certain conditions. This paper provides a solution for filtering-colored objects with the help of a robotic arm. Items placed on the transmission belt are sorted based on color perception and moved to a specific location. When an object is moving from place to place in a transmission belt, the sensors provide inputto a small controller and then issue a command to the robot arm to perform the function. The TCS3200 color sensor is used to detect the color of an object. DC motors are used to move the conveyor belt, gripper, and lift. Arduino Nano microcontroller is used to provide instructions. The L293D motor driveris used to drive engines and the LCD display makes the user-friendly system.

3. PROPOSED SYSTEM

Relays controlled by the Regulator to drive the dc motor of the transmission belt. The laser diode emits a laser beam and is received by an LDR sensor that sends a signal to the controller. A Servo motor is used to separate a large and small bottle in a container.

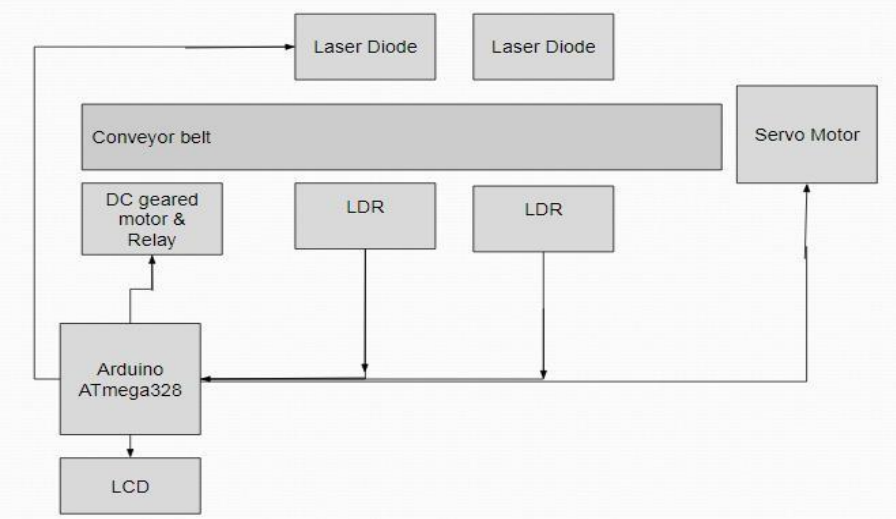

Fig.1: Block Diagram

4. COMPONENTS OF HARDWARE

Arduino Nano:

The Arduino Nano circuit board with Arduino IDE can read analog or digital signals from a variety of sensors, turn on the engine, turn on / off the LED and perform many other such functions. All operationsare performed by sending a set of instructions to the ATtmega328 microcontroller, on board via Arduino IDE. Arduino board includes Power USB, Power (Barrel Jack), voltage controller, crystal oscillator, voltage pins (3.3v, 5v, gnd, vin), analog pins A0 to A5, icsp pin, power led indicator, tx and rx led.14 digital input / output pins, Aref, and Arduino reset. Arduino Uno is a microcontroller board, based on ATmega328. The performance of the Uno board is different from all other boards in that it does not useFTDI USB on the serial driver chip. Instead, the Atmega328 is programmed as a USB to serial converter.The ATmega328 is a CMOS 8-bit microcontroller with low power based on the RISC advanced AVR architecture

- Active Voltage (logic level) 5 V
- Input Voltage (recommended) 7-12 V

- Input Voltage (limits) 6-20 V
- Digital I / O Anchors 14
- Analog Input PIN 8

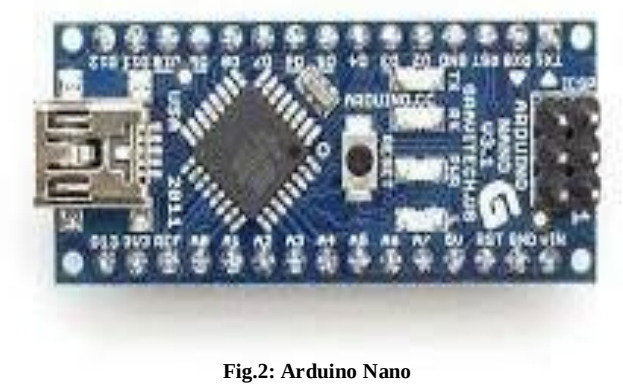

Fig.2: Arduino Nano

Relay:

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relaysare used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers: they repeated the signal coming in from one circuit and re- transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

- 5 Volt DC Single Pole Double Throw Relay
- Supports 250V AC / 10Amp
- Supports 110V DC / 15Amp

Fig.3: Relay

Laser Diode

Semiconductor laser diode laser diodes are electrically charged when the gain is generated by electrical energy flowing in the p-n junction or (often) the p-i-n structure. In this type of laser heterostructure of bipolar interband, electrons and holes can reconnect, emitting energy components such as photons. This process can be automatic, but can also be triggered by incident photons, which lead to increased magnification, as well as visual feedback from laser resonator to laser oscillation. An article on semiconductor lasers explains in detail how the process of laser amplification in semiconductor works.

Fig.4: Laser Diode

LDR Sensor

It can detect ambient light and LASER power. Adjustable sensitivity (with adjustment of the blue digitalpotentiometer)

- Operating voltage 3.3V-5V
- Digital Switches (0 and 1) -D0

Fig.5: LDR Sensor

DC Geared Motor

An electric car is an electric motor that converts electrical energy into a machine power. Many electric motors operate interacting between engines magnetic field and electrical energy in wire winding to generate energy in the form of rotation of the shaft. Electric motors can be powered by direct current (DC) sources, e.g. From batteries, cars, or filters, or from alternating current (AC) sources, e.g.

power grid, inverter, or power generators. The electric generator is the same as the machine an electric motor, but it operates backwards, converting mechanical power in electrical energy.

- RPM: 10.
- Active Voltage: 12V DC
- Gearbox: Gear boxed plastic (spur)
- Shaft width: 6mm and internal hole
- Torque: 7 kg-cm
- No current load = 60 mA (Maximum)
- Upload current = 300 mA (Maximum).

Fig.6: DC Geared Motor

Servo Motor

A servomotor is a closed-loop servomechanism that uses position feedback to control its motion and final position. The input to its control is a signal (either analogue or digital) representing the position commanded for the output shaft

- Stall Torque (4.8V): 10kg/cm
- Operation Voltage: 4.8 - 7.2Volts
- Gear Type: All Metal Gears
- Control System: Analog
- Operating Angle: 180 degrees

Fig.7: Servo Motor

LCD

The Arduino IIC / I2C interface is designed to minimize the use of IO hole in the Arduino board 16 characters wide, 2 lines. The single LED backlight installed can be easily dimmed by a resistorSupply voltage: 5V

Fig.8: LCD

5. RESULT/CONCLUSION

Design a prototype filtering material using a conveyor belt. Implementation of the proposed method of sorting items based on their size automatically Reducing human resource processing efforts. Manage theproduct properly as each company requires.

REFERENCES

[1] Automatic Material Separating Conveyor, IJISET - International Journal of Innovative Science, Engineering & Technology, Vol. 3 Issue 12, December 2016 ISSN (Online) 2348 - 7968 | Impact Factor(2015).

[2] ARDUINO BASED OBJECT SORTING, International Journal Of Innovations in Engineering Research And Technology [IJIERT], ISSN: 2394-3696 2 nd National Conference on Trends of ModernElectrical Engineering (NCMTEE-2K18) 30-31st March-2018.

[3] Industrial Development of Automated Industrial Filtering and Calculation of Arduino Machines, International Journal of Engineering and Science (IJES) || Volume || 6 || Problem || 4 | Pages | PP 56-59

[4] || 2017 | Sheela S, Shivaram. K. R, Meghashree S, Monica L, Prathima A, Shriya M. Kumar, Low Cost.

[5] Automatic Planning Processes in Conveyor Belt, International Journal of New Research in Science, Engineering and Technology, ISSN (Online): 2319-8753, May 2016.

[6] S. M. Shinde and R.B. Patil, “The Improvement Method Used by the Roller Conveyor System for Weight Loss,” International Journal of Engineering Research & Technology (IJERT), vol. 1, no.5,2012.

[7] D.A. Hounshell, From the American System to Mass Production, The Development of Manufacturing Technology in the United States, (The Johns Hopkins University Press, 1984) 1800-1932.

[8] Vanamane, S. S., Mane, P. A. & Inamder, K. H., 1, no.1, pp. 48-52, 2011.

[9] Daniyan, A. O. Adeodu and O. M. Dada, “Design of Holding Materials: Belt Conveyor SystemCrushed Limestone Using 3 Idlers,” Journal of Advancement in Engineering and Technol-ogy, vol.1, no.1, 2014.

[10] Aniket A Jagtap, Shubham D Vaidya, Akash R Samrutwar, Rahul G Kamadi and Nikhil V Bhende, “Designing Materials: Belt Conveyor System for Crushed Biomass Wood Using V V Transfer System , ”International Journal of Engineering Engines and Robotics Research, vol.4, no.2,2015.

[11] Seema S. Vanamane and Pravin A. Mane, “Design and Analysis of Belt Conveyor System for Fungal Cooling,” Inter-national Journal of Engineering Research and Applications (IJERA), vol.2,and .3, 2012.

[12] Mr Memane Vijay and Professor N. S. Biradar, "Design and Analysis of the Belt Conveyor Systemfor Sugar Industry for Weight Reduction," Journal of Emerging Technologies and Innovative Research(JETIR), vol.2, no.5,2015.