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Smart Sensing Bin

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A B S T R A C T

At present,situation Every person in this world throws waste in the form of plastics, wet waste, dry waste and etc. Nowadays technologies is improved a lot so, to protect our environment we came up with project called smart sensing bin by using Arduino Uno. It can be used for the segregation purpose. In this proposed technology we have designed a smart sensing bin using Arduino Uno along with servo motor,moisture sensor,buzzer and battery etc.

Keywords: Arduino Uno, servo motor, Ultrasonic sensor

1. Introduction

Nowadays, the garbage has become major problem in our country. it can leads to many environmental issues and we have a very large population movement in the cities and towns,so people tend to litter the places due to lack of dustbins and lack of our negligence.If there are dustbins present also,the waste are most likely to be fallen outside the bin. this is because the bins are not monitored or cleaned properly and another problem faced is segregation as most of the people do not segregate the waste which they are disposing so,to eradicate this problem we have came up with this project ,which segregate the waste dumped and also indicate almost all the factors that can keep our environment clean and hygiene.

1.1.Literature survey

The first paper was referred by the designed smart waste bin for smart waste management. The author was AksanWijaya ,ZahirZainudd. it was published in the year August 2017. the elements were A smart waste bin consists of a smart sensor and communication.

The second paper was refered by the smart garbage monitoring and clearence system using IOT. the author was Vinoth kumar ,senthilkumaran,Krishna kumar&Mahantesh . it was published in the year 2016. the elements were smart waste clean management system which checks the waste level over the dustbin by using sensor systems.

The third paper was refered by the smart dustbins for smart cities. the author was Bikramjitsingh,Manpreet Kaur. it was published in the year 2016. the elements were This system to garbage collection providing greater accessibility,planning proper for disposing process.

1.2. Components

Component	Quantity
Arduino Uno	1
Ultrasonic Sensor	1
Buzzer	1
Moisture Sensor	1
Servo Motor	2
PIR Sensor	1
Battery	1

1.3. Methodology

1.1 Arduino Uno

Arduino is an open-source physical computing platform based on a simple i/o board and a development environment that implements the processing/wiring language. Arduino can be used to develop stand-alone interactive objects or can be connected to software on your computer.

1.2 Ultrasonic Sensor

An Ultrasonic sensor is an transceiver module means it acts like transmitter + receiver. it transmits high frequency ultrasonic waves of frequency greater than 20khz. it intercepts the waves reflected by an obstacles.

1.3 Moisture Sensor

The moisture sensor is used to measure the wet and dry. many sensors are the type of variable resistors. Resistors are the electronic components that can be used for slow the flow of the electricity through the circuit. resistor come in variety of levels depending upon the component which are paired with. variable resistor are the resistors whose resistance level varies based on the environmental factor. moisture sensors resistance level vary based on the amount of moisture they are exposed.

1.4 servo motor

A servo motor is a closed-loop systems where precise position control commonly found in the industrial and commercial applications. they are comprised of several parts namely control circuit, shaft, amplifier and even an encoder or resolvers. A servo motor is a selfcontrolled electrical device that rotate parts of a machine with high efficiency and great precision the output part of this motor can be moved to a particular angle ,position and velocity that a regular motor does not have. It will utilizes the regular motor and couples with the sensor for positional feedback the controllers are the most important part of the servo motor designed and use specifically.

1.5 PIR Sensor

It is a Passive Infrared sensor which detects the human being or object moving around within 10m from the sensor. it is very much sensitive to the objects or human skin temperature through emitted blackbody radiation on the infrared wavelengths, in contrasts to the objects at room temperature.

2. Objectives

- To enhance healthy and hygiene
- Time saving operation and automatic process
- To keep environment clean and safe
- Segregate the waste automatically into dry and wet waste

3. Block diagram

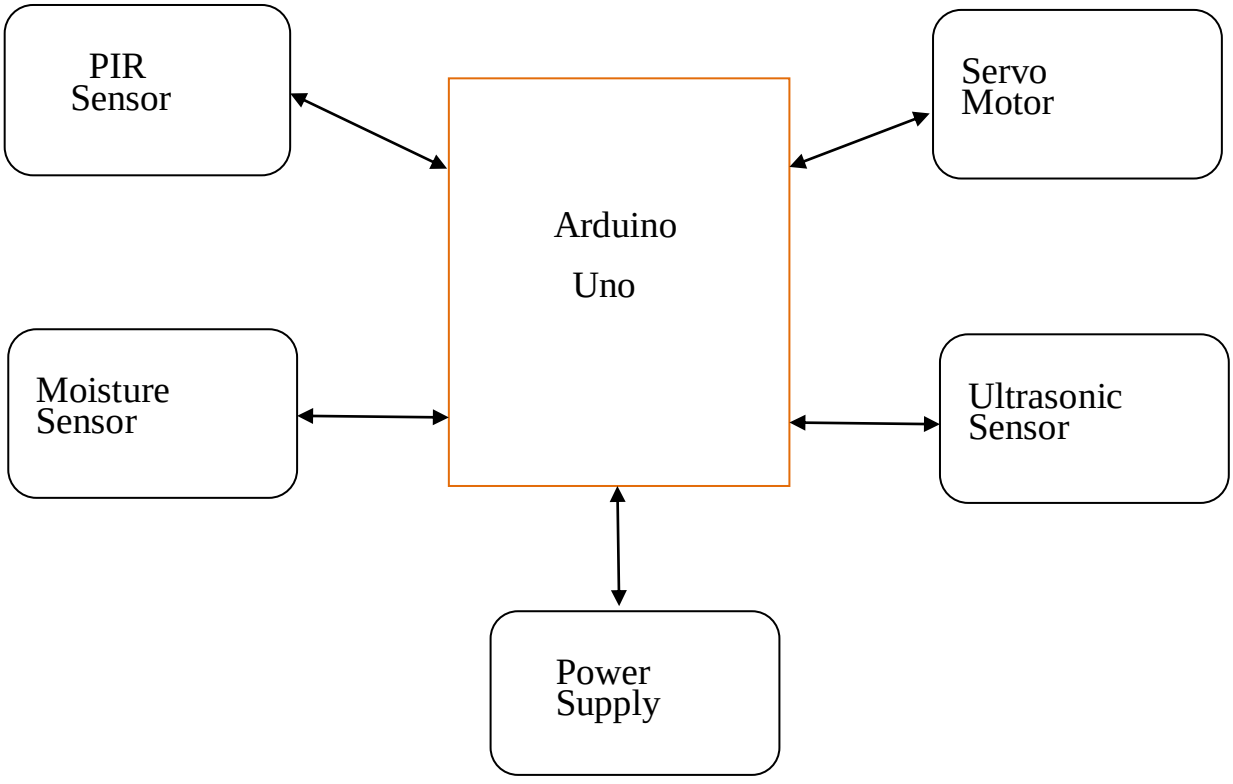

Fig. 1 - Smart sensing bin block diagram

4. Working procedure

We have placed the ultrasonic sensor inside the dust bin it is exposed to the environment. Hence when a person comes close to the bin, the sound waves gets disturbed. The ultrasonic sensor detects and sends signal to the Arduino. Then Arduino sends the signal to the servo motor, which is connected to the lid of the bin and hence the bin gets opened. The servo motor is a small device that has an output shaft. This shaft can be positioned to the specific angular position by sending the coded signal to servo. As long as coded signal existed the input line, the servo will maintain its angular position of the shaft. Moisture sensor is attached to the another servo motor which is used for the segregation. Now the person who has come into the vicinity of bin has to place the waste over the moisture sensor. The moisture sensor has to determine it is dry or wet waste depending upon the waste that has to put. If the waste is said to be dry and hence the value is sent from moisture sensor to the Arduino. Based on the value, the Arduino decides whether the servo motor has to turn $+90^0$ or -90^0

So, in this project we can configure that as. dry waste is put on the moisture sensor, the servo motor has to rotate $+90^0$ and it falls to the left portion of smart bin.If it is wet waste, the servo motor has to rotate -90^0 and it falls to the right side of smart bin. And we have placed an LEDs for dry waste it indicates blue and wet waste it indicates red. If the bin is full it indicates red.

5. Conclusion

This smart sensing bin is built to segregate easily. We can separately store the recyclable material for reusing purposes and it is very much helpful for the blind peoples to segregate.

By using this method of waste collection, mainly in urban areas becomes more easier. it helps in reducing air pollution time management, time and manpower. it is very much convenient to the people. this project can add an edge to the cities aiming to get smart and people friendly

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