IoT Based Smart Garbage Detection System

What: Arduino Mega 2560 R3 board. Four SR04 Ultrasonic Sensors. A Wi-Fi module - Rees52 Arduino Compatible Esp8266 Serial Esp-01 Wi-Fi Wireless Transceiver Module. Other necessary wires and PBCs. Operating System: Windows XP and above. Browser: Opera, Firefox, Chrome Programming Language: JS enabled in browser.
Why: This implementation of Smart Garbage Collection System using IoT ensures the cleaning of dustbins soon after the garbage level reaches its maximum. If the dustbin is not cleaned at a specific time, then the record is sent to the higher authority who can take appropriate action against the concerned official. This system also helps to monitor the fake reports and hence can reduce the corruption in the overall management system.
How: We use ultrasonic sensors and its other hardware microcontrollers and processors such as Arduino for analyzing the garbage levels and sending information about it to administrators and then garbage trucks are being deployed by them. Another very important aspect of our project is the web portal that is designed in such a way that operators and citizens will both find it user friendly to monitor the garbage information of various places.

Smart Garbage Management System

What: Microcontroller Atmel328, IR, GSM, LED, Arduino Uno, Weight sensor.
Why: This system ensures the cleaning of dustbins soon when the garbage level reaches its maximum This reduces the total number of trips of garbage collection vehicles and hence reduces the overall expenditure associated with garbage collection. It ultimate helps to keep clean in the society. The use of solar panels in such systems may reduce energy consumption.
How: For garbage detection, weight sensors can be used. It gives the weight of the garbage in the dustbin. Level detectors consist of IR sensors which are used to detect the level of the garbage in the dustbin. The output of level detector is given to microcontroller. Four IR sensors are used to indicate the different levels of the amount of garbage collected in the dustbin which is placed in public area. When the dustbin is filled up to the highest level, the output of fourth IR receiver becomes active low. This output is given to microcontroller to send the message to the Control room via GSM module.

IoT Based Smart Garbage and Waste Collection Bin

What: Microcontroller ARM (LPC2148), UV Sensor, PRS Modular sensor
Why: The project aims at cleanliness of the areas where trash bins are located and the very basic management that it contains with it. It aims at advanced management of the whole garbage collection system. The technologies which are used in the proposed system are good enough to ensure the practical and perfect for solid garbage collection process monitoring and management for green environment.
How: The IR sensors will show us the various levels of garbage in the dustbins and the weight sensor gets activated to send its output ahead when its threshold level is crossed. These details are further given of the microcontroller (ARM LPC2148) and the controller gives the details to the transmitter module This UV Sensor indicates the level of garbage filled in dustbin and Sensor is planted on the top of dustbin to Show us the actual level of garbage present in it. GPRS Module helps us to send the details of the dustbin at the Receiver side. At the receiver section a mobile handset needs to be connected to the Wi-Fi router so that the details of the garbage bin are displayed.

IOT BASED GARBAGE MONITORING USING ARDUINO

What: HC-SR04 ultrasonic sensor, Arduino Uno, GSM module, Connecting wires, buzzer
Why: We have built an efficient garbage monitoring system which can be used to monitor the level of garbage in the dump. This data can be further used to plan garbage collection trips more efficiently, ultimately reducing overflowing bins and helping have better public sanitation. Uses very small amount of electricity. Ultimately helps in better planning of garbage pickups.
How: In this project we put the ultrasonic sensor on top of the garbage bin/ dump. The output of the ultrasonic sensor is processed by the Arduino, and the output is then sent to the GSM module which sends a text message to the concerned person. We have a threshold value of 5cm.Which means that if the distance of the sensor from the top of the garbage is less than 5cm, the output will come with a message that the basket is full. Also, a buzzer will ring if output is less than 5cm. The DHT11 sensor will show the temperature and the humidity.

Smart Garbage Monitoring System using Internet of Things (IOT)

What: Microcontroller, Power Supply, WI-FI Modem, Ultrasonic Sensor, GSM Module, LCD
Why: The developed system provides improved database for garbage collection time and waste amount at each location. By implementing this project, we will avoid overflowing of garbage from the container in residential areas which is previously either loaded manually or with the help of loaders in traditional trucks.
How: For this the system uses ultrasonic sensors placed over the bins to detect the garbage level and compare it with the garbage bins depth. The system makes use of Arduino family microcontroller, LCD screen, Wi-Fi modem for sending data and a buzzer. The system is powered by a 12V transformer. The LCD screen is used to display the status of the level of garbage collected in the bins. A web page is built to show the status to the user monitoring it. The web page gives a graphical view of the garbage bins and highlights the garbage collected in color to show the level of garbage collected. The system puts on the buzzer when the level of garbage collected crosses the set limit.

Similarities

- Each project used ultrasonic sensors for detecting garbage
- used Arduino for analyzing the garbage levels and sending information about it to administrators.
- used GSM/GPRS Module which helps to send the details of the dustbin at the Receiver side.
- These five projects can detect only solid garbage.
- They used IOT (Internet of Things).
- In every project we can see that they are tracking garbage collection vehicles and sending all information to them.

Difference

- Three projects have used GUI interface but other two projects didn't use it. GUI is used to display different parameters and information regarding the garbage and garbage collection viz. location of dustbin, status of the dustbin, date & time of garbage collection. The GUI has also the provision to display the name and mobile number of the contractor, who is responsible for cleaning the dustbin of location.

- Two projects used web portal which is two-way communication between user and portal. But other three projects didn’t use web portal.