ELECTRONIC – ZIGBIN FOR MEDICAL APPLICATIONS

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ABSTRACT

we present the Smartbin system that identifies fullness of litter bin. The system is designed to collect data and to deliver the data through wireless mesh network. The system also employs duty cycle technique to reduce power consumption and to maximize operational time. The Smartbin system was tested in an outdoor environment. Through the testbed, we collected data and applied sense-making methods to obtain litter bin utilization and litter bin daily seasonality information. With such information, litter bin providers and cleaning contractors are able to make better decision to increase productivity.

I. Introduction

When the waste is collected from hospital is done manually which would affect the waste collecting persons can be affected by air -bone disease. Usually, the medi waste will be collected manually this situation will be generally collected by humans with naked hands which would spread disease to the waste collector and his family. But this method can be time processing, expensive and inaccurate. Automatic segregation of waste in hospital using the combination of line follower with smart bin application techniques provide fast and accurate results. This project is concerned with a new approach to the development of medical waste automatic segregation system, based on waste segregation, by Advances in computer vision present an opportunity to expand and enhance the practice of collecting waste from the medical hospitality system. disease and extend the market of computer vision applications in the field of precision hospital management.

II LITERATURE REVIEW

1. Line follower cons

waste bin includes a container with a lid, and its enclosure is equipped with sensors such as the HC-SR04 module, an ultrasonic sensor responsible for measuring the level of waste filling present inside the compartment. This is significant within the solution, because through its operation it is possible to avoid the overflow of waste or excessive garbage deposit. The solution also includes a present in the compartment. It is characterized by a great importance within the system, since many residues have a small volume and significant mass. The load sensor is coupled to a specific driver, such as HX711, which amplifies the signal emitted by the load cell in addition to providing interconnection with the microcontroller [1]

2. Smart _ Bin

The concept Internet Of Things (IoT) can be closely tied together with home automation. IoT devices, such as smart thermometers, can be controlled by, for example, a smartphone and thus possibly providing worldwide range through the Internet. These devices together with the rising popularity of the smartphone account for one of the reasons to the increase in home automation. Home automation with IoT devices provides great convenience and means of optimizing energy consumption by, for example, enabling automatic energy saving or presenting power consumption IoT equivalents. Therefore, when converting to a smart house, a major issue is making all non-IoT devices compatible with a home-automation system. Gill et al. identify the intrusiveness of installations as one of the areas that have hindered consumer adoption of home automation technologies. [2]

3.GSM based system.

urbanization has increased tremendously. At the same phase there is an increase in waste production. Waste management has been a crucial issue to be considered. This paper is a way to achieve this good cause. In this paper, smart bin is built on a microcontroller-based platform Arduino Uno board which is interfaced with GSM modem and Ultrasonic sensor. Ultrasonic sensor is placed at the top of the dustbin which will measure the stature of the dustbin. The threshold stature is set as 10cm. Arduino will be programmed in such a way that when the dustbin is being filled, the remaining height from the threshold height will be displayed. Once the garbage reaches the threshold level ultrasonic sensor will trigger the GSM modem which will continuously alert the required authority until the garbage in the dustbin is squashed. Once the dustbin is squashed, people can

reuse the dustbin. At regular intervals dustbin will be squashed. Once these smart bins are implemented on a large scale, by replacing our traditional bins present today, waste can be managed efficiently as it avoids unnecessary lumping of wastes on roadside

4. serial communication

D. Serial Communication Computers transfer data in two ways:1) Parallel: Often 8 or more lines (wire conductors) are used to transfer data to a device that is only a few feet away 2) Serial: To transfer to a device located many meters away, the serial method is used. The data is sent one bit at a time. PC use RS232 interfacing standard for Serial Communication. An interfacing standard RS232 was set by the Electronics Industries Association (EIA) in 1960.The standard was set long before the advent of the TTL logic family, its input and output voltage levels are not TTL compatible. In RS232, a 1 is represented by -3 ~ -25 V, while a 0 bit is +3 ~ +25 V, making -3 to +3 undefined.

5. Application for monitoring medi-bin.

GPRS-based Home Automation and images of the house to its owner's mobile through GPRS. The webcam detects movement by comparing frames and also light intensity. Video streaming of the proposed work is done using the home Internet connection, not the GSM modem. U. Ali proposes another home and office automation system using GPRS in mobile phones. The user interacts with the home via a client/server architecture implemented at home using a PC and a micro-Java application. Home devices are controlled by a controller, which is connected to the computers parallel port [5]
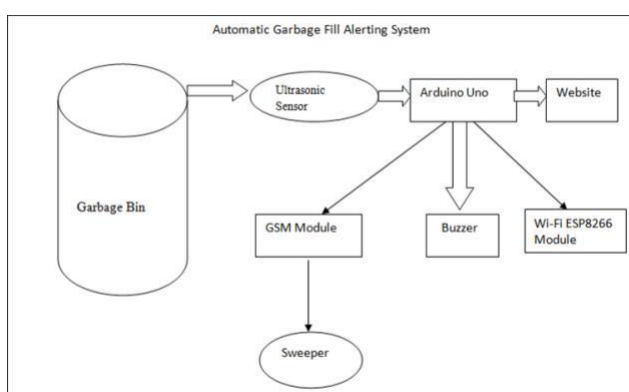
III IMPLEMENTATION

Fig.1 Architecture Diagram

Our proposed system uses as the lid of the Smart Bin is equipped with the IoT device and a Ultrasonic Range finder, which will monitor the level of the waste collected inside the Bin. Once the level of waste

reaches the set threshold value, the status is updated on to the cloud by the IoT device. The same information will be reflected on the Android app available with the Municipal Corporation members who are be responsible for the waste management. The department can now send the Robotic vehicle to the respective location to collect the garbage. Once the vehicle is dispatched and it reaches the location the entire vehicle can be controlled by the second android application. controlled by just clicking few buttons on the Android app and while the bin is still in the air, there is a mechanism in the robotic system to collect the waste accumulated around the bin. Once the hospital bin is full it will be taken back to the dump yard for the further waste processing. Once the waste bin is cleared, the status of the bin on the cloud is updated. Embedded pre-programmed commands will be predominant the condition which is been applied will only been activated. The interconnection of the cloud and the microcontrollers with networks system. Finally, the data collection and the data will be seen through the web application the application is been created with HTML, java script language with temporary static data web application is developed. The PIR sensor will observe a person nearby dustbin. If motion is detected the lid of dustbin is opened, the servo motor activates and as GSM connected it will send an alert message to user if dustbin is filled.

Dustbin placed in public place, people throw garbage in dustbin, place the ultrasonic sensor in top of the garbage bin. If dustbin reach in 75% then Arduino send message through GSM module. When dustbin level is reach threshold level buzzer will give alert sound for don't again put waste in dustbin. This all process updated in IOT GECKO platform for monitoring garbage bin.

LIST OF MODULES

Our proposed system is made up of these following modules:
Module 1: Input system condition
Module 2: inter connection of microcontroller
Module 3: Pre-processing steps
       3.1: Installing and importing libraries
       3.2: Controlling the system of each electronic
Module 4: Smart bin in GSM
Module 5: interconnect system to cloud
       5.1: ubidots cloud
       5.2: web application.
Module 6: robotic system to control
       6.1: line follower controller
       6.2: Channel connected with system
       6.3: output result for condition 1&2
       6.4: smart medi bin application system

Module 7: Proposed system.
      7.1: interconnect modules

MODULE 1: INPUT SYSTEM CONDITION

ZigBee, much like 6LoWPAN, is a low-cost, low-power, wireless mesh network) and has received ample attention as an up-and-coming protocol technology. Advances in ZigBee include connecting to the Internet using low-power, low-cost ZigBee radios. The idea is to leverage the ZigBee radio send and receive IPv6 packets to enable applications to send data back.

MODULE 2: INTERCONNECTION OF MICROCONTROLLER

In this project, we designed to control home devices by remote, app and IP address.
Remote is connected with central controller and IRDA (Infra-red Data Association) is connected to both central connector and IRDA Decoder, a local wi-fi sensor to process in the Dom server to give the output.IP address is connected with cloud via internet, the given IP address is moved to the local network by detecting information's from cloud network, then it processes under the main Dom server to give the output.

MODULE 3: PRE-PROCESSING STEPS

we make use of three important libraries of python.
First of all, for installing these libraries we should have the latest version of pip installed in our system.
Those three important libraries are as follows:
    The end individual can utilize their mobile phone or PC to sign into the machine. A fundamental test is accomplished for whether the equipment instrument is ON or not. handiest on the off chance that the equipment is approved and ON, at that point the individual is verified. when the confirmation is done accurately, individual is then equipped for send the control alarms to the equipment machine. at the equipment device the SL intention power program will always follow for the change inside the distinction and will thusly transport the markers to the Circuit. while a client chooses an exchange inside the notoriety for any of the instrument [I. e. ON or Off], the records from the hand-held is sent to the web Server in a string design, wherein the web – site is the host. at the server the status is spared in the database of their non-open device field. at the equipment end, the circuit power program a web website page is utilized to rescue the notoriety of the contraptions in a reasonable example [for each 10sec]. those changes come quite close to treats

[which are transitory web files] from the web server and are spared at the PC inside the name of the net site on the web. thusly every 10 sec on the grounds that the site page is revived and the new treat esteems are modernized.4.6.3Proposed Home Automation System Functions

MODULE 4: SMART BIN TO GSM

Communication via the network In this mechanism communication is done via the network with the use of network cables and a switch. This medium is accurate since equipment's can be distinguished with unique ip addresses assigned to them and also it does not impose any limitation on the number of equipment's that can be connected. Though this mechanism requires wiring of equipment to the home computer this can be avoided with the use of Ethernet over power (EOP) mechanism.
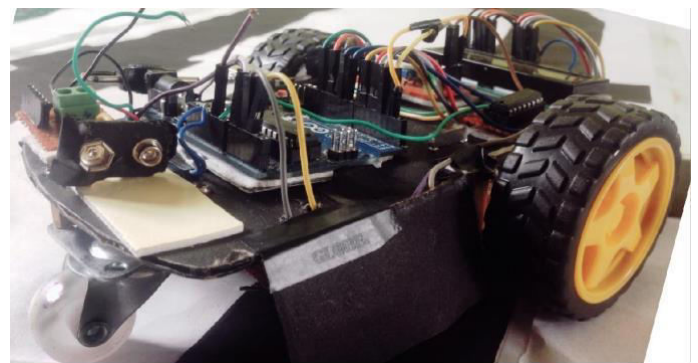

Fig.2 electric circuit

Fig.3 LINE FOLLOWER CONS

MODULE 5: INTERCONNECTION OF CLOUD

A. Cloud Server

Cloud server is used for central storage. Centralization gives cloud service providers complete control over the versions of the browser-based applications provided to clients, which removes the need for version upgrades or license management on individual client computing devices. Cloud server contains user databases, glass fish sever, glassfish is an open source application server which is designed to make the web services accessible in an efficient and easy way

Client

This is the remote user who wants to automate home appliances by using android mobile device or the client pc. Android is a Linux-based operating system primarily designed for mobile devices such as smart phones and tablet computers utilizing ARM processors

89C51 I Microcontroller

The AT89C51 provides the following standard features:

4K bytes of Flash, 128 bytes of RAM, 32 I/O lines, two 16-bit timer/counters, a five vector two level interrupt architecture, a full duplex serial port.XTAL1 and XTAL2 are the input and output, respectively, of an inverting amplifier which can be configured for use as an on-chip oscillator ,A quartz crystal oscillator is connected to inputs XTAL1 (pin19) and XTAL2 (pin18) The quartz crystal oscillator(11.0592MHz) also needs two capacitors of 33 pF value. RESET (Pin 9) pin is an input and is active high (normally low). Upon applying a high pulse to this pin, the microcontroller will reset and terminate all activities. The four 8-bit I/O ports P0, P1, P2 and P3 each uses 8 pins. PORT 0 can be used for input or output, each pin must be connected externally to a 4.7K ohm pull-up resistor .This is due to the fact that P0 is an open drain, unlike P1, P2, and P3. Open drain is a term used for MOS chips in the same way that open collector is used for TTL chips.

MODULE 6: ROBOTIC SYSTEM

. The proposed robot consists of two IR sensor and one motor driver circuit L293D with 2 DC motor for left side wheel and right-side wheel. The Arduino uno is the heart of the robot. Here we use ultrasonic sensor to detect the amount of garbage present in the dustbin. And gas sensor is used to sense the odor of the proposed system. The line following bot needs mechanical arrangement of the chassis. Let's assume a two-wheel robotic vehicle with one castor

wheel for front side. There are two IR sensors which are fixed on to the robot facing the earth's surface. Working of line following robot is based on the IR sensor output. The principle behind the IR sensor is when the light hits the surface, only small amount of energy is absorbed and rest of the energy gets reflected. Surfaces of different kinds absorb and reflect light in different portions. Black will absorb lighter when compare to white surface. The reflected light intensity is detected by the receiver as shown in fig. based on this, we will get the output high and low Here the robot reaches its destination by detecting the line drawn over the surface. The motion of the robot is based on the output of two IR sensors

Cloud Server Cloud server is used for central storage. Centralization gives cloud service providers complete control over the versions of the browser-based applications provided to clients, which removes the need for version upgrades or license management on individual client computing devices. Cloud server contains user databases, glass fish sever, glassfish is an open-source application server which is designed to make the web services accessible in an efficient and easy way B. Client This is the remote user who wants to automate home appliances by using android mobile device or the client pc. Android is a Linux-based operating system primarily designed for mobile devices such as smart phones and tablet computers utilizing ARM processors. 89C51 I Microcontroller The AT89C51 provides the following standard features: 4K bytes of Flash, 128 bytes of RAM, 32 I/O lines, two 16-bit timer/counters, a five vector two level interrupt architecture, a full duplex serial port.XTAL1 and XTAL2 are the input and output, respectively, of an inverting amplifier which can be configured for use as an on-chip oscillator ,

MODULE 7: SYSTEM IMPLEMENTATION

The line following robot is automobile system that has ability to recognize it's path , move and change the robot's position toward the line in the best way to remain in track.

This project report presents a photodiode sensor based line follower robot design of 200gm weigh which always directs along the black line on white surface. The electromechanically robot dimension is $192 \times 100 \times 70 \ mm^3$ with max rpm 180 at no load and frictionless condition. The minimum turning radius for the system is 100mm at velocity of 24.2 cm/s. The robot is able to detect it's path in case it is out of path. The line following robot project challenged the group to cooperate, communicate, and expand understanding

of electronics, mechanical systems, and their integration with programming. The successful completion of every task demonstrated the potential of mechatronic systems and a positive group dynamic. Construction of application for collecting waste. The PIR sensor will observe a person nearby dustbin. If motion is detected the lid of dustbin is opened, the servo motor activates and as GSM connected it will send an alert message to user if dustbin is filled.

Dustbin placed in public place, people throw garbage in dustbin, place the ultrasonic sensor in top of the garbage bin. If dustbin reach in 75% then Arduino send message through GSM module. When dustbin level is reach threshold level buzzer will give alert sound for don't again put waste in dustbin. This all process updated in IOT GECKO platform for monitoring garbage bin.

Working of Line Follower Robot using Arduino Working of line follower is very interesting. Line follower robot senses black line by using sensor and then sends the signal to Arduino. Then Arduino drives the motor according to sensors' output. Working of line follower Here in this project we are using two IR sensor modules namely left sensor and right sensor. When both left and right sensor senses white then robot move forward.
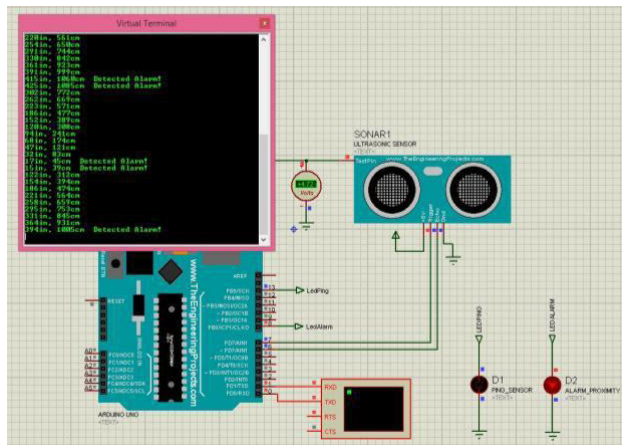

Fig.4 Input Image\ Frame

Fig.5 Output

IV. CONCLUSION

In This project work is the implementation of Automatic Garbage Fill Alerting system using Ultrasonic sensor, Arduino Uno, Buzzer and Wi-Fi module. This system assures the cleaning of dustbins soon when the garbage level reaches its maximum in hospital for each patient . It will take power supply with the help of Piezoelectric Device. If the dustbin is not cleaned in specific time,then the record is sent to the Sweeper or higher authority who can take appropriate action against the concerned contractor. This system also helps to monitor the fake reports and hence can reduce the corruption in the overall hospital management system. This reduces the total number of trips of garbage collection and hence reduces the overall expenditure associated with the garbage collection in hospitals . It ultimately helps to keep cleanliness in the society. Therefore, the Automatic Garbage Fill Alerting system makes the garbage collection more efficient.

FUTURE ENHANCEMENT

The main aim of this project to reduce human resources and efforts along with the enhancement of a smart hospital vision. The proverb "Cleanliness is next to god and clean city is next to heaven" inspired us to conceptualized the project Smart dustbin helps us to reduce the pollution. Many times, garbage dustbin of medi waste will be collected by workers dustbin were this can spread more AIR-BORNE disease. This project can avoid such situations. And the message can be sent directly to the waste management instead of the contractor's office. Swatch Bharat Abhiyan is a national campaign by the Government of India, covering 4,041 statutory cities and towns, to clean the hospitals infrastructure of the hospital country. In the further years this project can be improved and modified by providing segregation and recycling medical of the waste. There can even be advanced cleaning techniques as the moving waste on the

hospitals. The advancement in the automobile can give rise to autonomous carry out this process. A proper waste management system is necessary to avoid spreading some deadly diseases.

V. REFERENCES

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