

# Garbage Monitoring System Using Arduino

Soumya C T<sup>1</sup>, Yathiraj G R<sup>2</sup>, Dechamma C A<sup>3</sup>, Harshitha H M<sup>4</sup>, Muthamma M K<sup>5</sup>, Thejaswini H J<sup>6</sup>

Department of Computer Science and Engineering

<sup>1</sup>Assistant Professor, Coorg Institute of Technology, Ponnampet, Karnataka, India-571216

<sup>2,3,4,5,6</sup> Coorg Institute of Technology, Ponnampet, Karnataka, India-571216

**Abstract-** *In the present day scenario, many times we see that the garbage bins or Dust bin are placed at public places in the cities are overflowing due to increase in the waste every day. It creates unhygienic condition for the people and creates bad smell around the surroundings this leads in spreading some deadly diseases & human illness, to avoid such a situation we are planning to design “Garbage monitoring system”. In this proposed System there are dustbins located throughout the city or the Campus, these dustbins are provided with low cost embedded device which helps in tracking the level of the garbage bins . In the proposed system, the level of waste material in the garbage bin has been detected with the help of ultrasonic sensor and it will continuously communicate to the authorized control room through GSM module. Microcontroller is used to interface the sensor system with GSM system. Information related to the garbage for various selected locations. This system will help to assure a healthy and hygienic environment.*

**Keywords-** Truss, Tendon, Prestressing ,Staad pro.

## I. INTRODUCTION

All Modernization and progress has had its share of disadvantage and one of the main aspects of concern is the pollution it is causing to the earth. With increase in the global population and rising demand for food and other materials, there has been a rise in the amount of waste being generated daily by each house and locality. This waste is ultimately thrown into municipal bins and ultimately, waste collection centers from where it is collected by the area municipalities to be further thrown into the landfills and dumping areas. However, either due to resource crunch or inefficient infrastructure and facilities, not all of this waste gets collected and transported to the final dumping sites. If at this stage the management and disposal is not done properly, it can cause serious impacts on health and the problems to the surrounding environment. . Government of India have been struggling for many years to find a way to manage the country’s increasing amount of garbage. To manage this garbage, there are some methods that has already been developed. The first method was developed using LCD and weight sensor. They have used weight sensor for detecting the weight of garbage in the dustbin, however weight sensor doesn’t give any information about the distance in the dustbin [4]. So, a latest system they

have replaced weight sensor with ultrasonic sensor to sense the distance between garbage in dustbin and gives the information to arduino, it will send to mobile using GSM model.

## II. EXISTING SYSTEM

In ‘smart garbage monitoring system’ system, the level of garbage in the dustbins is detected with the help of Sensor systems, and communicated to the authorized control room through GSM system. Microcontroller is used to interface the sensor system with GSM system. A GUI is also developed to monitor the desired information related to the garbage for National Conference on Product Design (NCPD 2016), July 2016 different selected locations. This will help to manage the garbage collection efficiently. Here in this system, Infrared (IR) sensor is used for garbage level detection. IR sensor radiates light which is invisible to the human eye because it is at infrared wavelengths, but it can be detected by electronic devices. GSM module is used for communication purpose, to send message to the control room when the container is full. Arduino board is used to interface the sensor and GSM module. The IR sensor arrangement is act as level detector .The output of level detector is given to the microcontroller. The AT commands are used to facilitate the messaging service through the GSM Module. This program is burned in the microcontroller with the help of Arduino software (IDE). These messages consist of information of garbage levels of respective dustbins. Depending on the information sent to control room, the authority informs the concern person of the respective area about garbage level. Then the concerned person makes sure that the garbage of that particular area is collected by sending the cleaning vehicles.

## III. PROPOSED SYSTEM

- Real time information on the fill level of the dustbin
- Deployment of dustbin based on the actual needs.
- Cost reduction and resource optimization.
- Improves Environment quality -Fewer smells - Cleaner cities
- Intelligent management of the services in the city.
- Effective usage of dustbins.

#### IV. HARDWARE REQUIREMENTS

The hardware requirements for the system are as follows.

**Ultrasonic Sensors:** Knowing the distance you are away from an object is very important in robotics or even for tasks just as simple as driving. Ultrasonic distance sensors use a sound transmitter and a receiver. An ultrasonic distance sensor creates an ultrasonic pulse, often called a "ping", and then listens for reflections (echo) of the pulse.

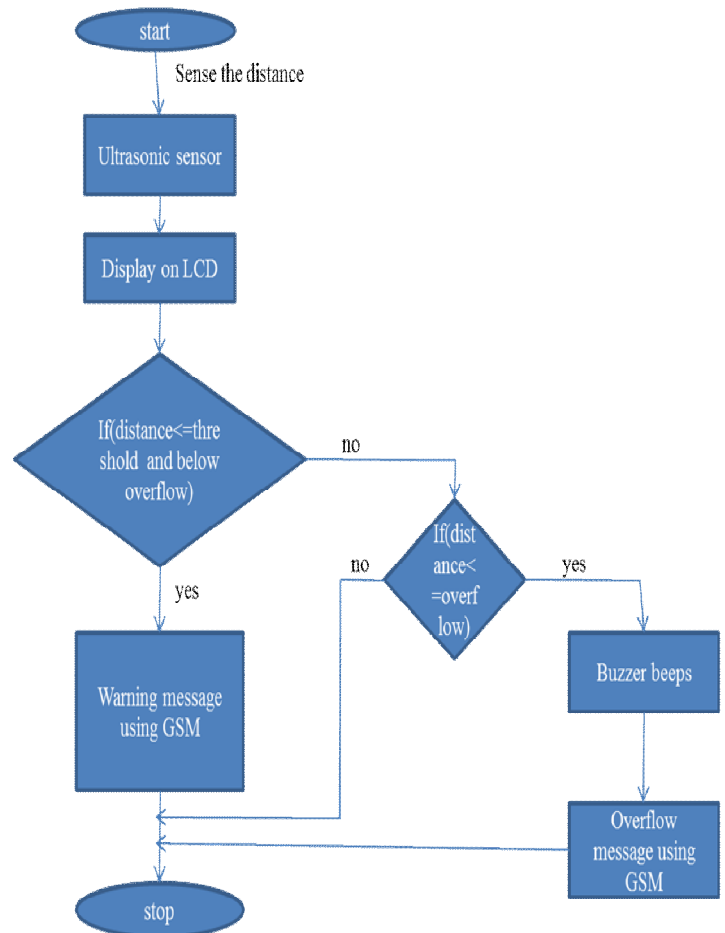
**GSM Modem:** GSM Modem can accept any GSM network operator SIM card and act just like a mobile phone with its own unique phone number. Advantage of using this modem will be that you can use its RS232 port to communicate and develop embedded applications. Applications like SMS Control, data transfer, remote control and logging can be developed easily using GSM.

**Arduino Board:** Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board.

**LCD Display:** it uses to shown the free space of bins.

#### V. WORKING PRINCIPLE

The working of our system is unpretentious [6]. Shows the block diagram of Smart Garbage Management System. Slave unit is placed in the garbage bin likely wise master unit is placed at the control room. Slave unit consists of Arduino Uno board which has Atmega328 IC, ultrasonic sensor and GSM module. The entire circuit is placed at top of the dustbin. In ultrasonic sensor, the trigger pulse is continuously sent in the dustbin and echo pulse reflects back to ultrasonic sensor. Ultrasonic sensor continuously checks the garbage level in dustbin [7]. Once the level of garbage reaches to specified threshold values, ultrasonic sensor gives indication to Arduino Uno board and through GSM, SMS will be send to control room which he cleaner of specific floor as the dustbin of that floor is fill. Ultrasonic sensor placed inside the dustbin continuously checks its status, whether it is full or not [10]. If the overflow of garbage over the predefined threshold occurs, then a message will be sent to the control room indicating the overflow of concerned garbage bin. Message will also be sent to the specific



cleaner of that dustbin. Also, status of the dustbin will be updated when it is cleaned.

#### VI. CONCLUSION

It is an automatic dust bin monitoring system in order to detect the full condition of the garbage bins. This provides the authorized users timely updates of the status of the garbage bins and thus eliminates the need of periodic manual check and overflowing garbage bins. This project also provides an additional features to add new message receivers or alter the existing authorized users. It also aims at classification of different waste and thus promoting waste management.

#### FUTURE SCOPE

GPS can use to pinpoint the exact location of the waste bin. Solar panels or nearby power lines can be used to power the entire system. Higher authorities can check the functioning of local bodies by monitoring the empty state of bins. One can incorporate an voice detection sensor IC to automatically open the lid upon voice activation. In an urban area with Wi-Fi access one can send the messages to the

destination via the internet connectivity. When considering a region with excessive waste disposals, one can make use of a load cell by providing a threshold value to detect the full condition of the garbage bin and also provides more accurate results

### REFERENCES

- [1] Theodoros Anagnostopoulos, Arkady Zaslavsky, Alexey Medvedev, “Robust Waste Collection exploiting Cost Efficiency of IoT potentiality in Smart Cities” , 2015 International conference on recent advances in Internet of Things (RIoT),7-9April 2015
- [2] Theodoros Anagnostopoulos, Arkady Zaslavsky, Alexey Medvedev, Sergei Khoruzhnicov,” Top-k Query based Dynamic Scheduling for IoT-enabled Smart City Waste Collection ”, 16th IEEE International Conference on Mobile Data Management, Australia 2015
- [3] Waikhom Reshmi, RamKumar Sundaram, M.Rajeev Kumar, “Sensor Unit for Waste Management: A Better Method,”, International conference on Science, Engineering and Management Research , ©2014 IEEE
- [4] Teemu Nuortioa, Jari Kytöjokib, Harri Niskaa, Olli Braˆysyb “Improved route planning and scheduling of waste collection and transport ”, Expert Systems with Applications 30 (2006) 223– 232,Elsevier.