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# Garbage Collection Robot

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**ABSTRACT:** Now-a-days, management of waste from its collection to dumping and disruption has become one among the best challenging and arduous chore for municipal corporations, all round the globe. To make this tedious job facile, a replacement concept of Garbage collection robot has been taken into consideration for Smart buildings, hospitals, schools and railway stations. Garbage collector thought is an advancement of traditional garbage collector by levitating it to become smart inculcating sensors and a few form of logic. This smart collector may be a revolutionary idea of application of line following garbage and glued garbage part on predesigned locomotive path. The fixed bin makes use of ultrasonic sensors for level of garbage detection and updates the coeval level of the bin to the rubbish car, using Bluetooth Module. This is thereby a totally automated system, making small contribution towards the theme of Unpolluted India Green India.

**KEYWORDS:** Garbage collection robot, IR sensor, Ultrasonic sensor, Bluetooth module.

## I. INTRODUCTION

Waste management or Waste disposal is all the activities and actions required to manage waste from its inception to its final disposal. This includes among other things, collection, transport, treatment and disposal of waste along side together with monitoring and regulation. It also encompasses the legal and regulatory framework that relates to waste management encompassing guidance on recycling etc. The term normally relates to all or any sorts of waste, whether generated during the extraction of raw materials, the processing of raw materials into intermediate and final products, the consumption of ultimate final products, or other human activities, including municipal (residential, institutional, commercial), agricultural, and social (health care, household hazardous waste, sewage sludge). Waste management is meant to scale back adverse effects of waste on health, the environment or aesthetics. Waste management practices aren't uniform among countries (developed and developing nations); regions (urban and rural area), and sectors (residential and industrial). Smart waste management is a thought where we will control many problem which disturbs the society in pollution and diseases. This project, to style a highly cost effective and utilitarian waste collection robot which learning of the rubbish as easy and convenient as possible. This project proposes the tactic where a robot are often wont to clean the polluted areas like garbage around the dustbin.

## II.OBJECTIVES OF THE STUDY

1. Monitoring the waste management.
2. Providing a smart technology for waste system.
3. Avoiding human intervention.
4. Reducing human time and effort.
5. Resulting in healthy and waste ridden environment.

## III. LITERATURE SURVEY

[1] EFFICIENT GARBAGE DISPOSAL MANAGEMENT IN METROPOLITIAN

AUTHOR NAME : G. Narendra kumar , Chandrika swami and K.N. Nagadarshini.

In this paper, rapid increase in population, has led to improper waste management in metropolitan cities resulting in increasedpests and spreading of diseases. An efficient method to dispose this waste has been designed with Wireless Sensor Networks (WSN) using VANETs. IEEE 802.11p has been adopted and multicast routing has been proposed to be implemented in Garbage Collecting Vehicle's (GCV) On Board Units (OBU) for effective communication. Road Side Units (RSU) and sensors have been made use of in the response system. Filling up of multiple bins at the same time and usage of reserve GCVs has been considered.



The prototype VANET based efficient garbage disposal system is induced in a metropolitan city environment and has been simulated in NS2 and the results are encouraging for implementation.

[2] SMART DUSTBIN

AUTHOR NAME : Twinkle sinha , K. Mugesh kumar , P.Sai sharan.

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.

[3] AN OVERVIEW FOR SOLID WASTE BIN MONITERING SYSTEM

AUTHOR NAME: M.D, Shaiful Islam , M.A , Hanna, Maher Arabiya , Hasan Basra.

In this paper , we have introduced an integrated system combined of Radio Frequency Identification (RFID), Global Position System (GPS), General Packet Radio Service (GPRS), Geographic Information System (GIS) and Web camera. The built-in RFID reader in trucks would automatically retrieve all sorts of customer information and bin information from RFID tag, mounted with each bin. GPS would give the location information of the collection truck. All The information of the center server would up-dated automatically through GPRS communication system. GIS map server is being used for truck monitoring. In this system, banana truck database has been developed in the way that information of bin and truck ID, date and time of waste collection, bin and truck GPS coordinates information, bin status and amount of waste are compiled in a data packet and stored for monitoring and management activities.

#### IV. EXISTING SYSTEM

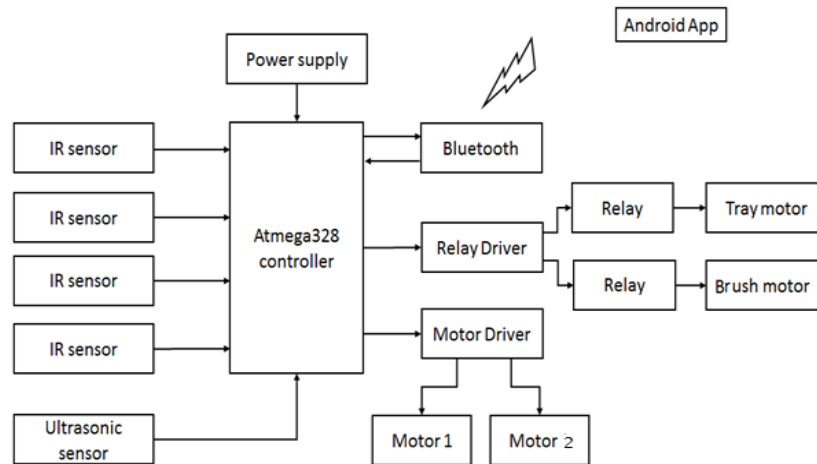
In today's era as we all know that where countries are developing at a rapid rate tons of unwanted waste is being generated like electronics, plastics and lots of biodegradable products. Waste management being the utmost spurned factors in developing countries creates an urgency to deal with this problem. In metropolitan or city areas, the clearance of waste management has been a grind task for the bulk of the country every where the planet there's need of a well- organized waste clearance system is mandatory by keeping green environment. There are many existing expertise mechanism are available for handling also as managing waste. But, the lacking for gathering information may be a major challenging task. This flounder will perturb the fast nationwide rate of growth in heaped urban areas also as its growing demand for the citywide ecological and environmental protection this is often a serious challenging in waste management system to create a prototype due to the paucity of designing and systematization among government, people and local authority for shipping and processing waste. Currently the waste gathering is conventional which acquire tons of labours and is time overwhelming process.

In existing project is an automatic garbage level detecting system informing the concerned authorities timely? Whenever the rubbish is full information are often send to the concerned authority to wash the bin. Here we use a less maintenance recent communication development like GSM. GSM is employed within the project as a communication back bone for the entire system for various reasons likes easy to implement and less signal deterioration. Hence these networks can work even with very low power.

#### V. PROPOSED SYSTEM

This project proposed the tactic where a robot are often wont to clean the polluted areas like garbage around the dustbin. Smart Garbage Collecting Robot, peak of the trash filled within the fixed part bin is identified using an Ultrasonic sensor. Microcontroller is especially used so on to interface the ultrasonic sensor with the Bluetooth module to regulate the robot through Android app through Bluetooth module. IR sensor is employed to detect obstacle ahead or back of the rubbish robot.





**Fig.1. Block Diagram For Proposed System**

The above figure represents the overall block for this proposed model. In this project, control a garbage collection robot through android app. This system consists of ultrasonic sensor, IR sensor, Atmega328 controller, driver, relay, motor and Bluetooth module. In this system use d four IR sensor. These are placed in the robot front, back, left and right side. It is used to detect the obstacle Ultrasonic sensor is used to detect the waste level in garbage tray. To control the garbage robot through android app via Bluetooth module. Controller receive the commands from Bluetooth and to control the robot through motor driver unit. Motor driver (L293D) is used to control the robot motor in forward and reverse/ left and right direction. If the robot collect the garbage, the ultrasonic sensor send the signal to controller. The controller the garbage tray through relay driver (ULN2003) unit. the relay driver is used to drive the tray motor.

## VI. HARDWARE DESCRIPTION

Battery used as supply. It's wont to give supply to all or any units. LM 7805 regulator is employed to take care of voltage as constant. Then signal are going to be given to next capacitor, which is employed to filter unwanted DC component. Load are going to be LED and resister. LED voltage is 1.75V.if voltage is above level beyond the limit, and then it will be dropped on resister.During this project we used Atmega328 controller. Reset switch is connected to pin no 1. It's wont to reset the program. The circuit diagram model is shown in the figure 4.2. To measure garbage tray level using Ultrasonic sensor. It's connected to controller port A0 (pin no 23). In this system used four IR sensor. These are placed within the robot front, back, left and right side. It's wont to detect the obstacle. These are connected to controller port A1 (pin no 24), A2 (pin no 25), A3 (pin no 26) and A4 (pin no 37). Controller receive the sensor signal, and to display status in LCD display. During this system to control the robot by using android application. To offer the command through android app via Bluetooth technology. Bluetooth (HC05) is connected to controller through interfacing unit. MAX232 used for interfacing controller and Bluetooth module. It's connected to controller port 2 & 3. Controller also to control the robot movement and tray position through driver unit. Robot movement like left and right, and forward and reverse direction through motor driver L293D unit. It's connected to controller port D4 to D7. Driver ULN2003 is connected to controller port D11, D12 & D13. Two relay we used. One is control the tray motor and another one is control the push movement. These two relays are connected to driver output port 15 & 16.

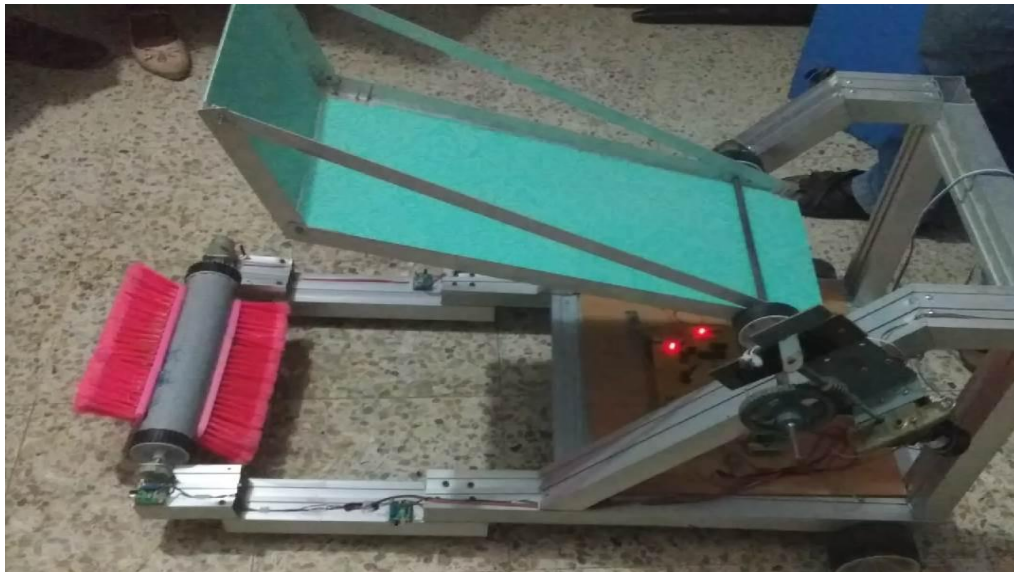


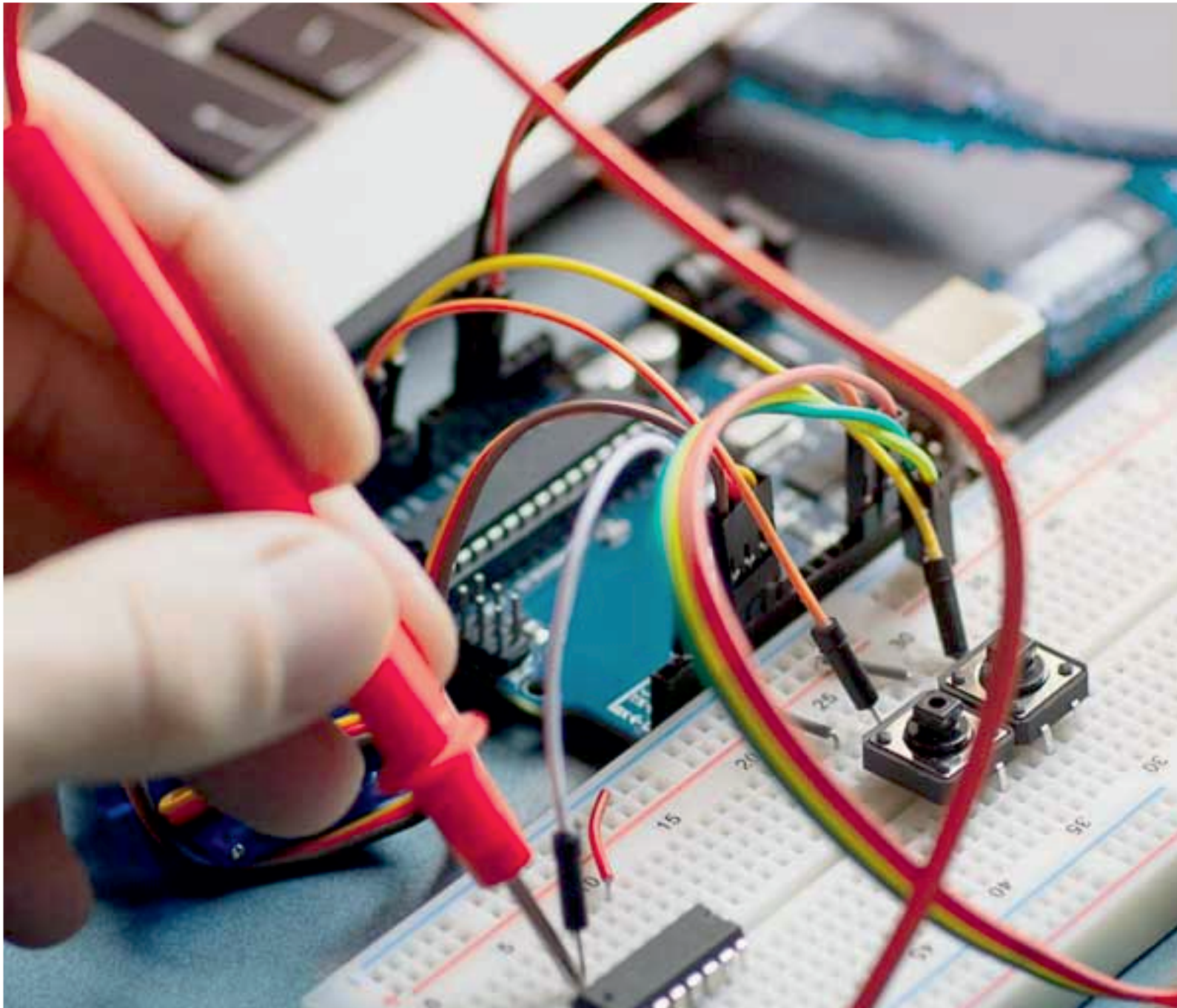
Fig.2. Prototype of proposed model

## VII. CONCLUSION

This project is devised to render the task of muck collection from differing places then dump it at a particular location from where the muck is conveniently taken for the action of reusing and recycling. By intimating the notification of level of garbage filled within the fixed dustbin to the rubbish car, we will decrease the number of trips of the rubbish collecting vehicle, thus saving power and money. Also by introducing the Bluetooth Module on the fixed dustbin part, we are making this technique fully automated. Thus, by implementing this project in real time scenarios we will make a contribution towards the enhancement of Smart City Project, thereby making the dream of Unpolluted India Green India come true.

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