BE EXTC SEM. VIII- Project Evaluation

Waste Segregation and Garbage Monitoring System

By

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Project Under the Guidance of

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Presentation Outline

1. Introduction
2. Literature Review
3. Implementation
4. Results & Discussion
5. Summary & Conclusion

Introduction

- Domestic waste disposal is an issue that is important to the management of any urban area.

- Globally, millions of tons of municipal solid waste are generated every day.

- Urban waste management is drawing increasing attention as it is posing health risks.

- Among the top ten diseases that have been recorded, we have cholera, intestinal worms and typhoid, which raises the alarm of a public health crisis.

1.1 Problem Overview

- Public cleanliness is important for individual health, which makes collecting and clearing the garbage regularly an important factor.
- Developed countries make more waste than the developing countries but they have efficient methods for treatment and disposal.
- Reducing the use of plastic by using paper bags/cloth bags, buying food with less packaging, reducing paper usage etc. will reduce the garbage, but whatever waste is generated needs to be disposed-off properly.
- Thus, timely collection and segregation of waste is needed that can be achieved through modern technologies.

1.2 Project Objective

- A garbage monitoring system is the need of the hour for an improved waste management and a healthy environment.
- A system that separates waste into different categories using sensors and later monitors the garbage/garbage bins in all localities and clears it once the bin is filled will save the time and fuel of the traditional garbage collecting trucks.

Literature Review

2.1 Methods for Segregation

Segregation using Sensors

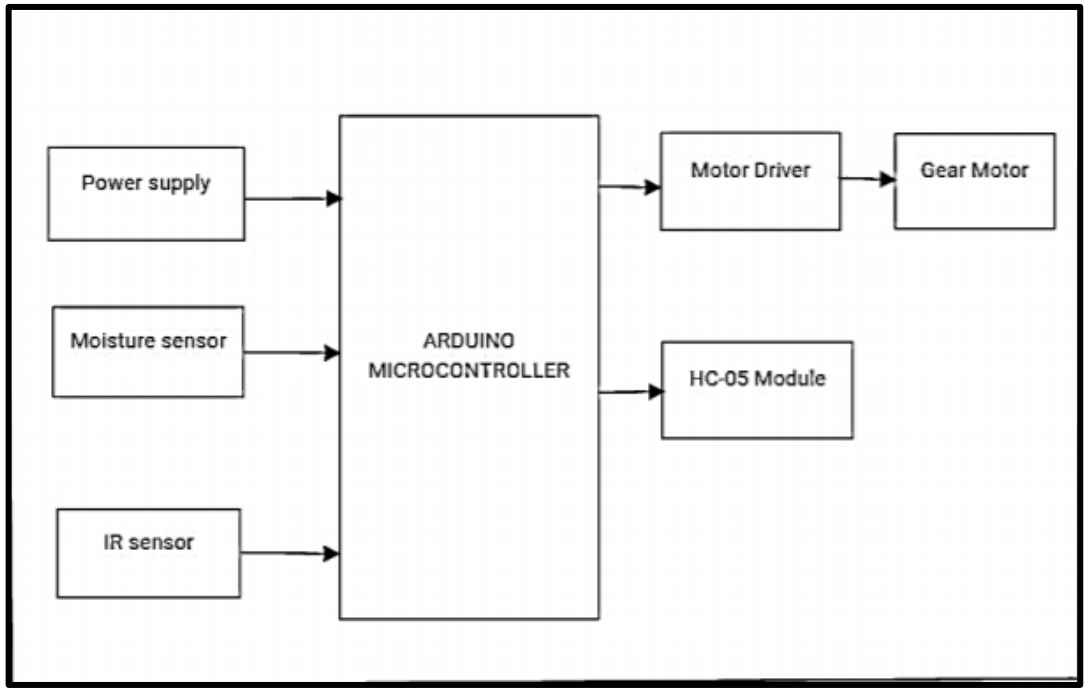


Fig. 1 Waste Segregation using Arduino [1]

Segregation using ML & Sensors

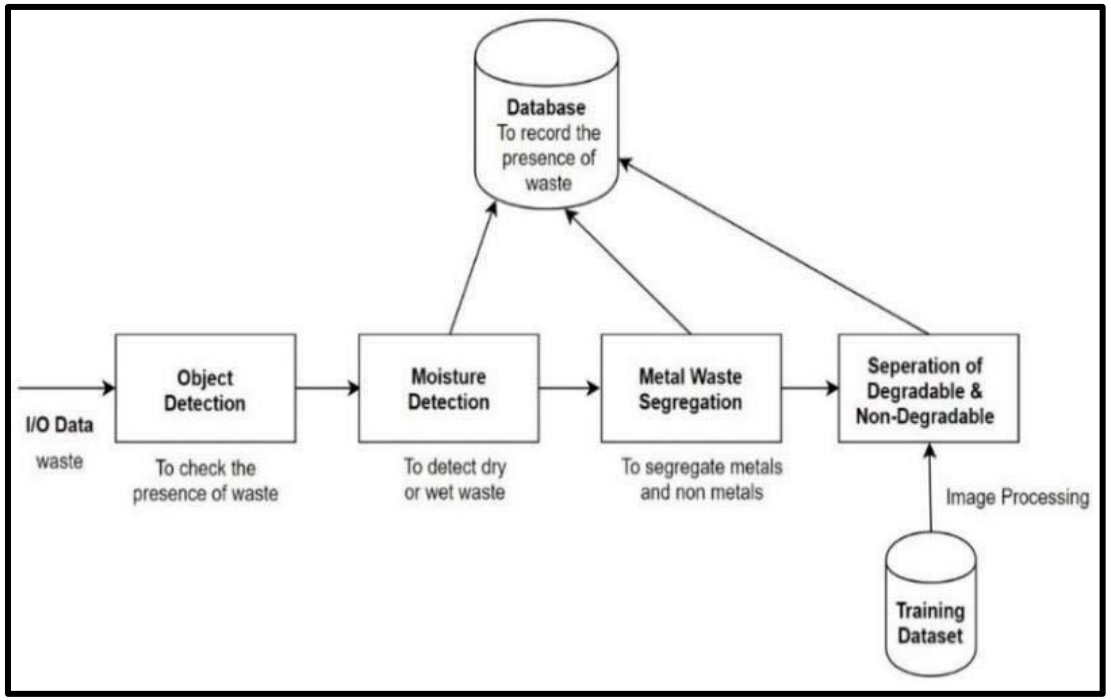


Fig. 2 Block diagram of proposed system [2]

2.2 Methods for Monitoring

Garbage monitoring using microcontroller AT89S52

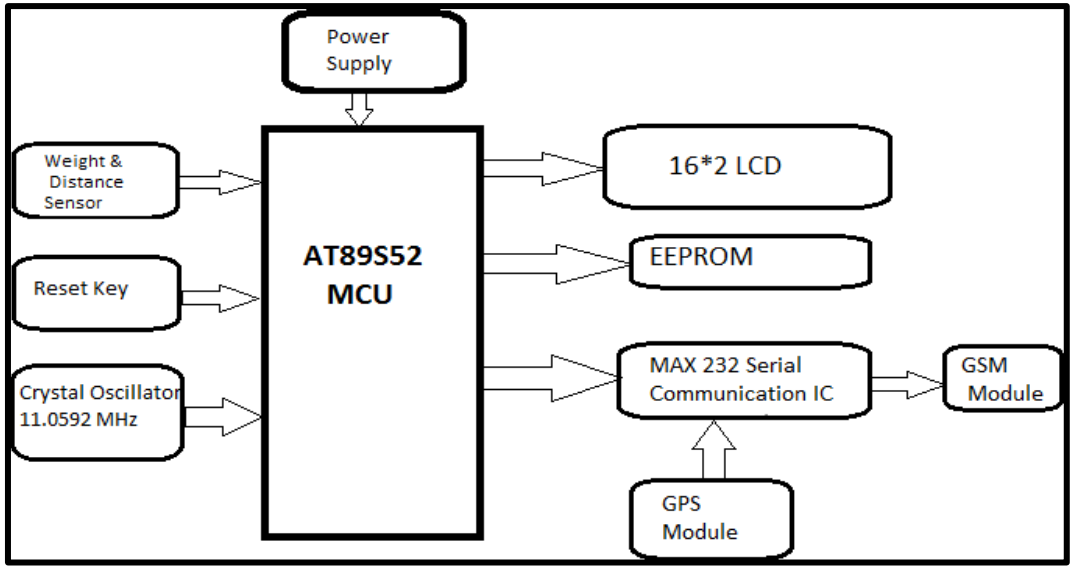


Fig.3 Flow of System [3]

Garbage monitoring using Arduino:

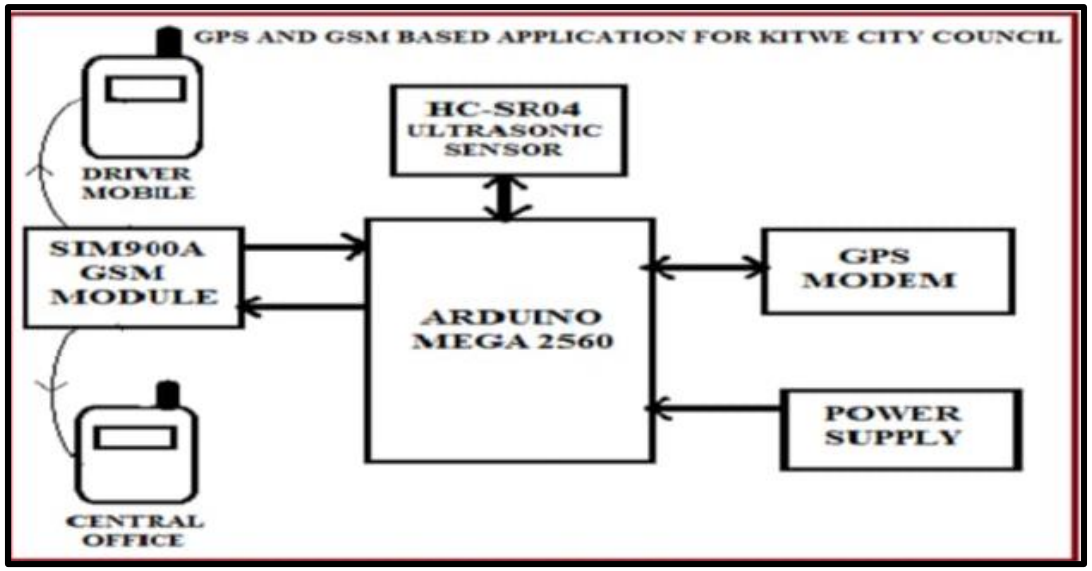


Fig. 4 Block Diagram of GPS & GSM Based System [4]

2.1 Various methods for monitoring (contd.)

Garbage monitoring using microcontroller AT89S52

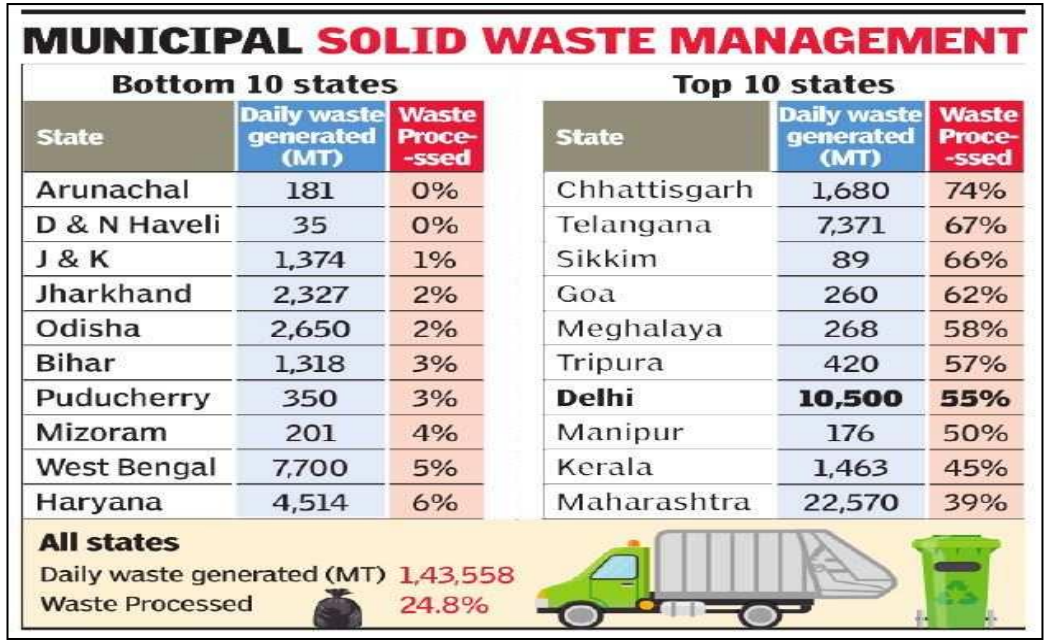
AT89S52 Microcontroller is used to interface sensor system with GSM system, it has 128 bytes of RAM,4K bytes of on chip ROM, two timers, one serial port and four ports all on single port. Sensors are used to monitor level of dustbin, after acquiring desired information output is given to microcontroller to send message via GSM module.

Garbage monitoring using Arduino:

Ultrasonic sensor placed on top of bin and triggered by Arduino Mega 2560, after reaching threshold value , the sensor sends the signal to Arduino mega which in turns activates GSM Module & GPS Modem.

2.3 Statistical Data

- India generates 62 million tons of waste every year, of which less than 60% is collected and around 15% processed.
- With megacities spurting a growth of 30.47% (Census 2011), India's basic necessities have sometimes been ignored.
- With an increasing focus towards services such as water, electricity and food for the growing population, the Indian administration has unfortunately ignored another major public service: waste management [5].



MUNICIPAL SOLID WASTE MANAGEMENT

Bottom 10 states

State	Daily waste generated (MT)	Waste Proce-ssed
Arunachal	181	0%
D & N Haveli	35	0%
J & K	1,374	1%
Jharkhand	2,327	2%
Odisha	2,650	2%
Bihar	1,318	3%
Puducherry	350	3%
Mizoram	201	4%
West Bengal	7,700	5%
Haryana	4,514	6%

Top 10 states

State	Daily waste generated (MT)	Waste Proce-ssed
Chhattisgarh	1,680	74%
Telangana	7,371	67%
Sikkim	89	66%
Goa	260	62%
Meghalaya	268	58%
Tripura	420	57%
Delhi	**10,500**	**55%**
Manipur	176	50%
Kerala	1,463	45%
Maharashtra	22,570	39%

All states
Daily waste generated (MT) 1,43,558
Waste Processed 24.8%

Fig. 6 Share of states in MSW generated [6]

Implementation

3.1 Block Diagram for segregation

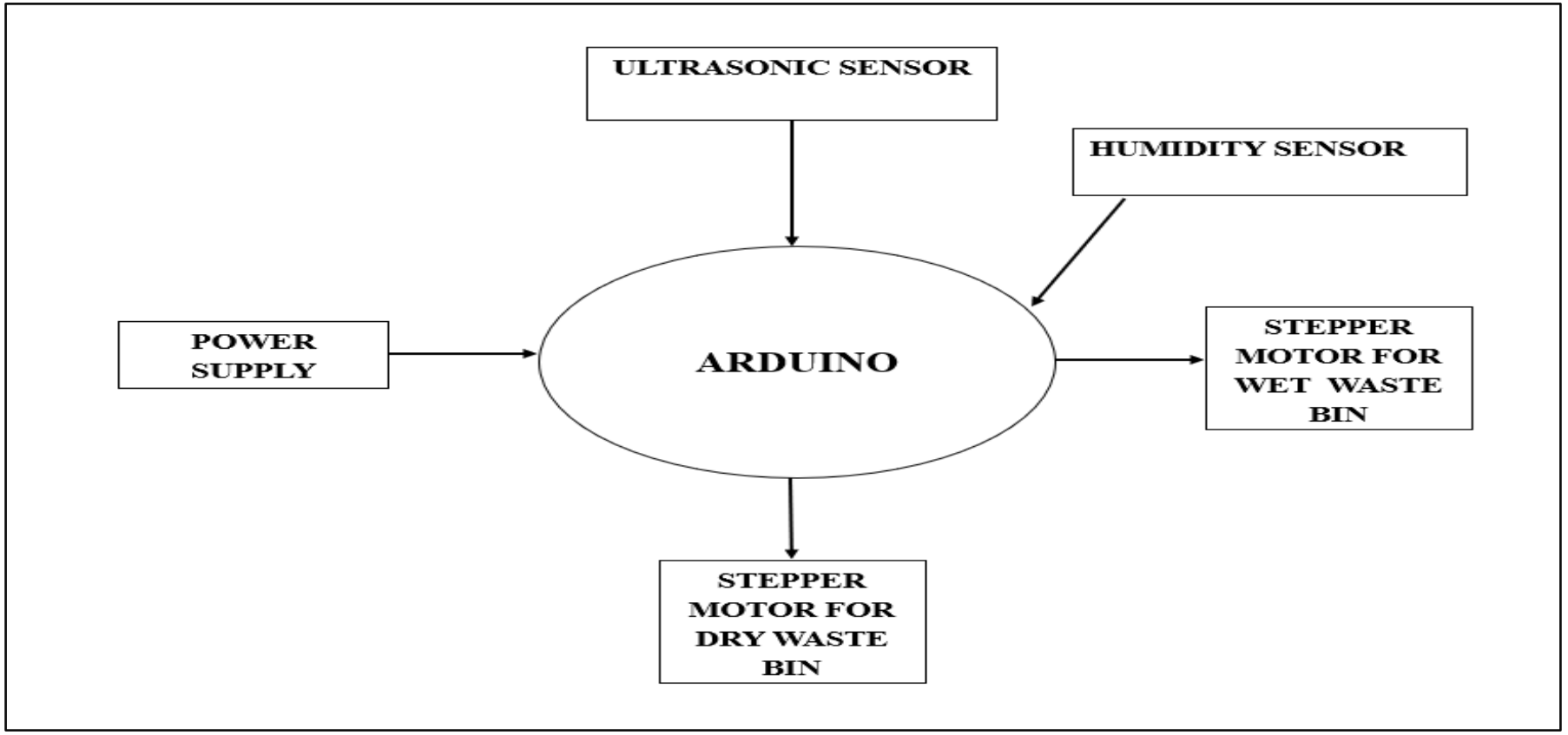


Fig.7 Block Diagram for segregation

3.2 Flow chart of segregation part

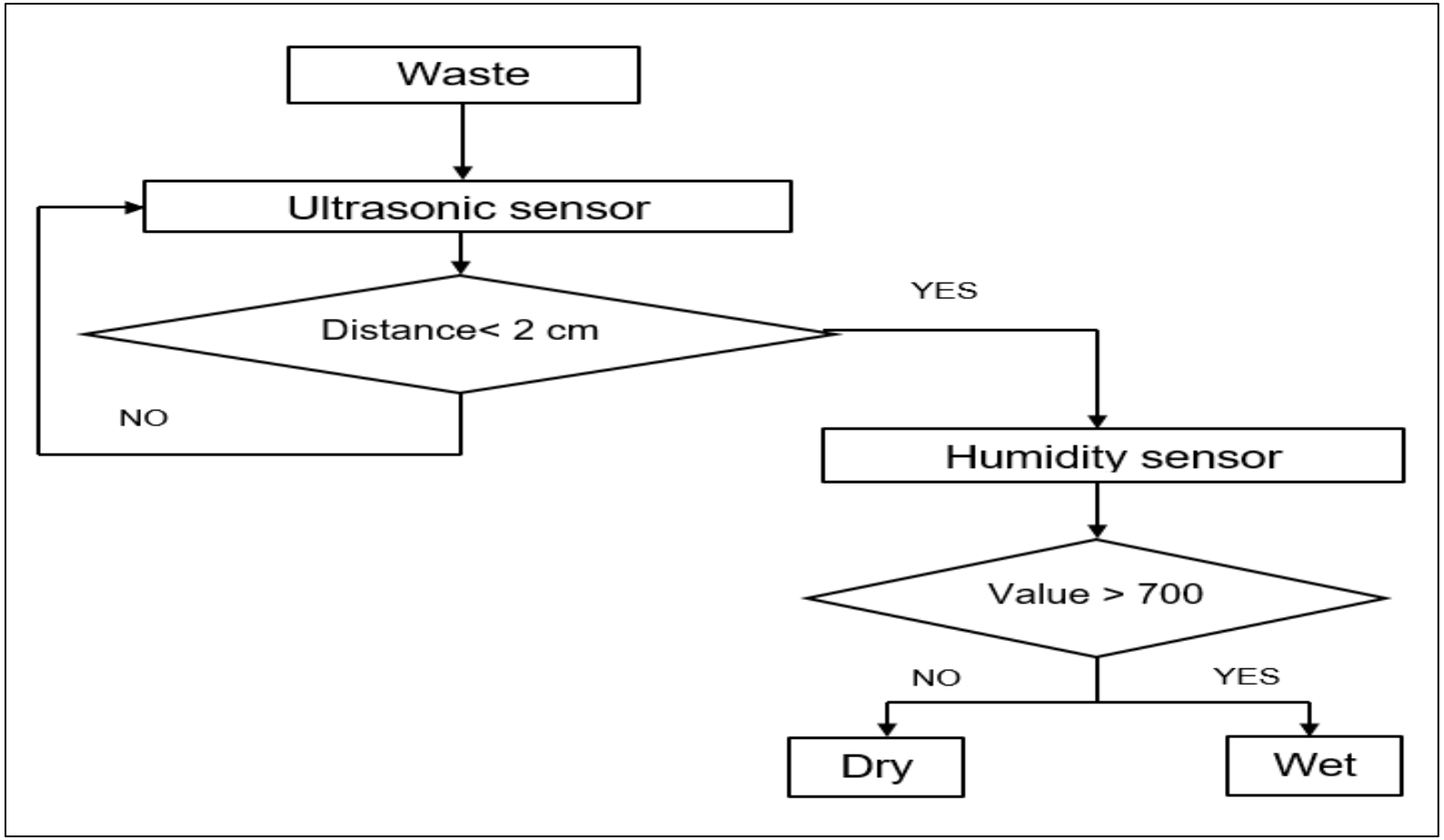


Fig. 9 Flow chart of segregation part

3.3 System Block Diagram

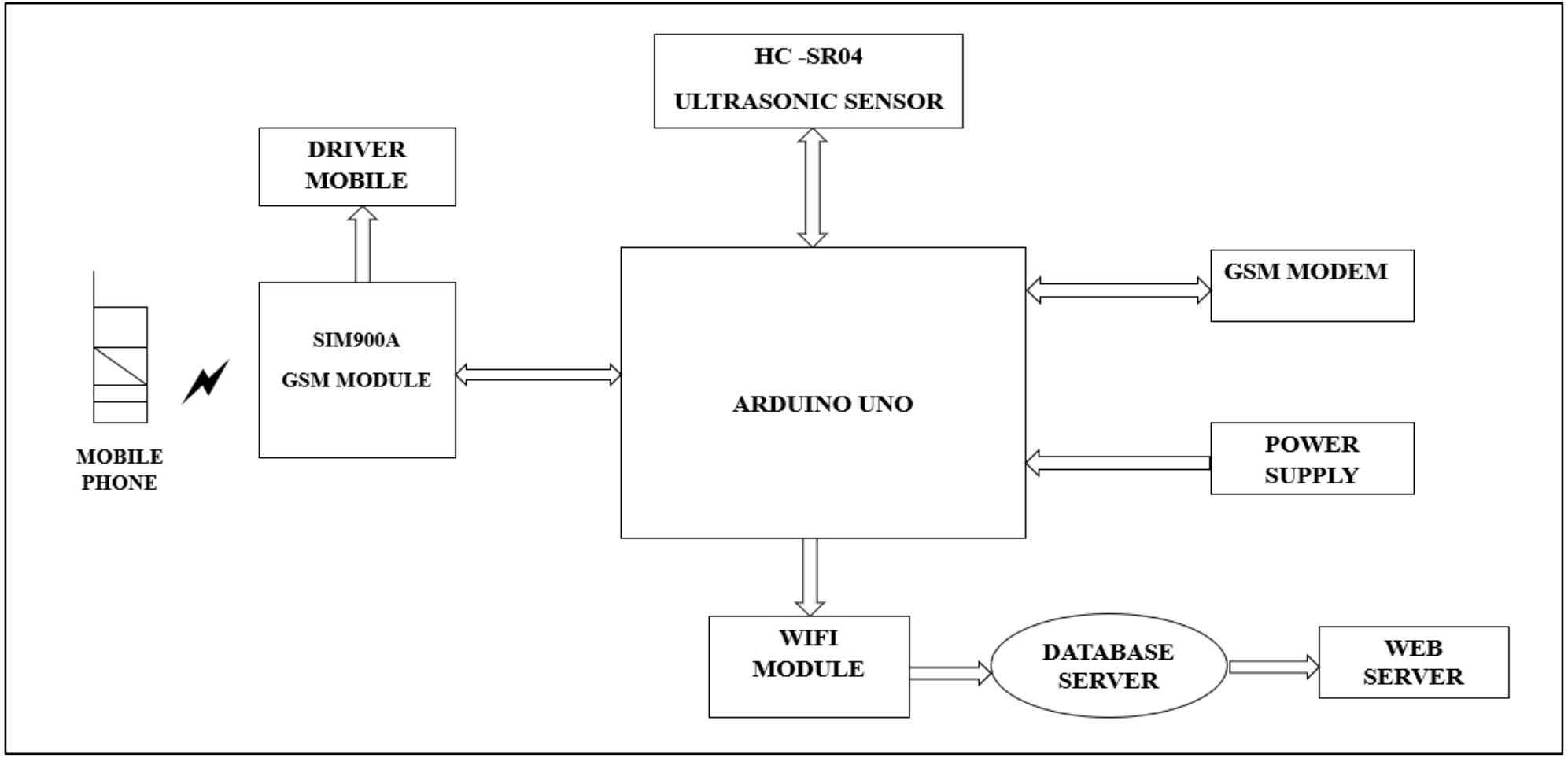


Fig. 10 Monitoring System

3.4 Flow Chart for monitoring part

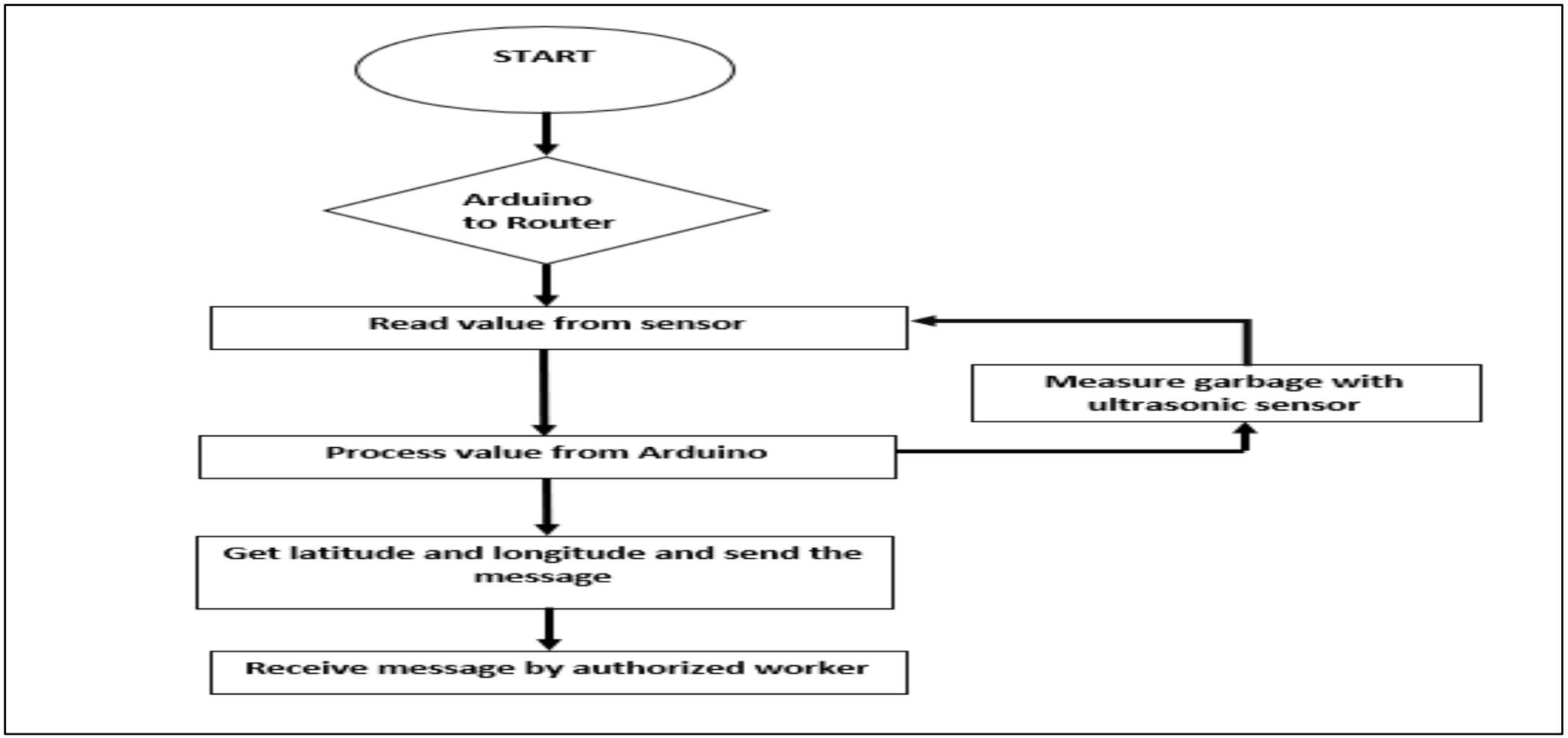


Fig. 11 Flow Chart for monitoring

Results and Discussion

RESULTS

A) Object recognition using ML

Fig. 12 Plastic bottle detection using ML

B) Simulating using Proteus

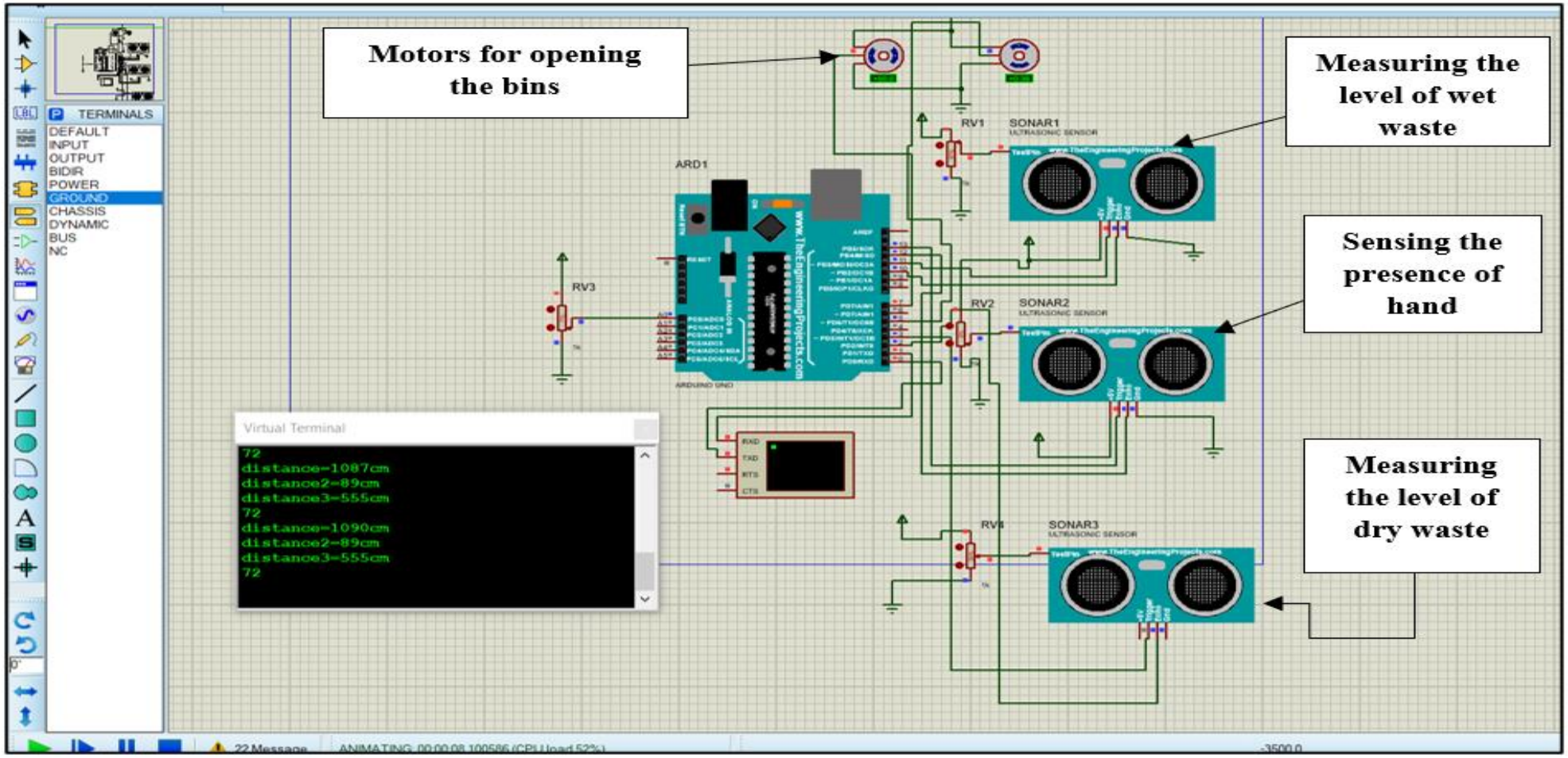


Fig.13 Proteus simulation output

C) Ultrasonic sensor

The ultrasonic sensor was tested to find out if it was giving the right measurements. The height of the dustbin used was 30 cm. Following are the test results:

Level of the garbage (in cm)	Distance from the sensor (in cm)	Distance from the sensor (in cm)
0	30	30
5	20	20
20	10	10

D) GSM module and GPS modem

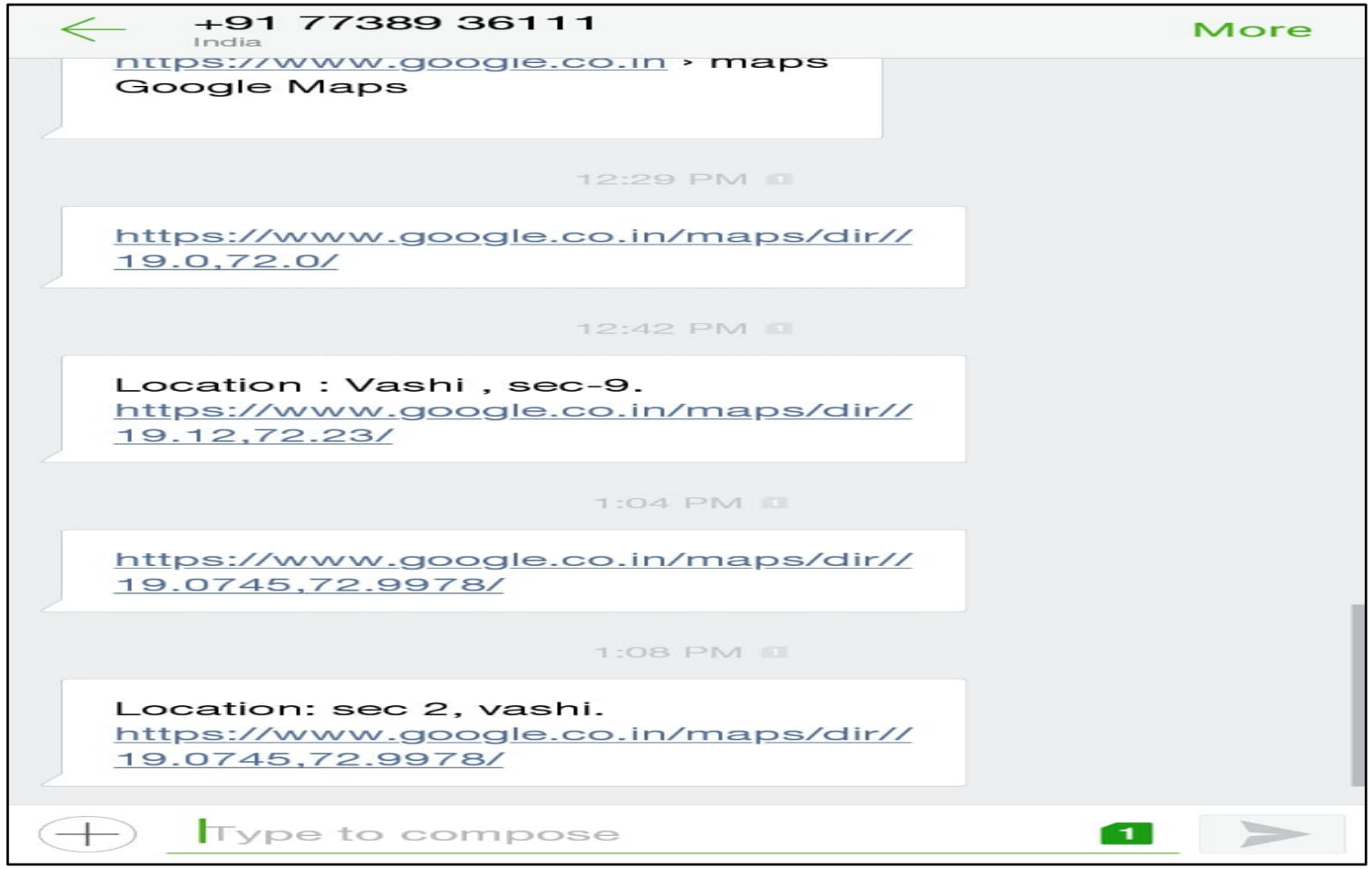


Fig. 10 Message received on the mobile phone

The GPS modem is used to send the location of the garbage bin. Whether the location sent by the GPS modem is correct or not is verified using the Google Maps app.

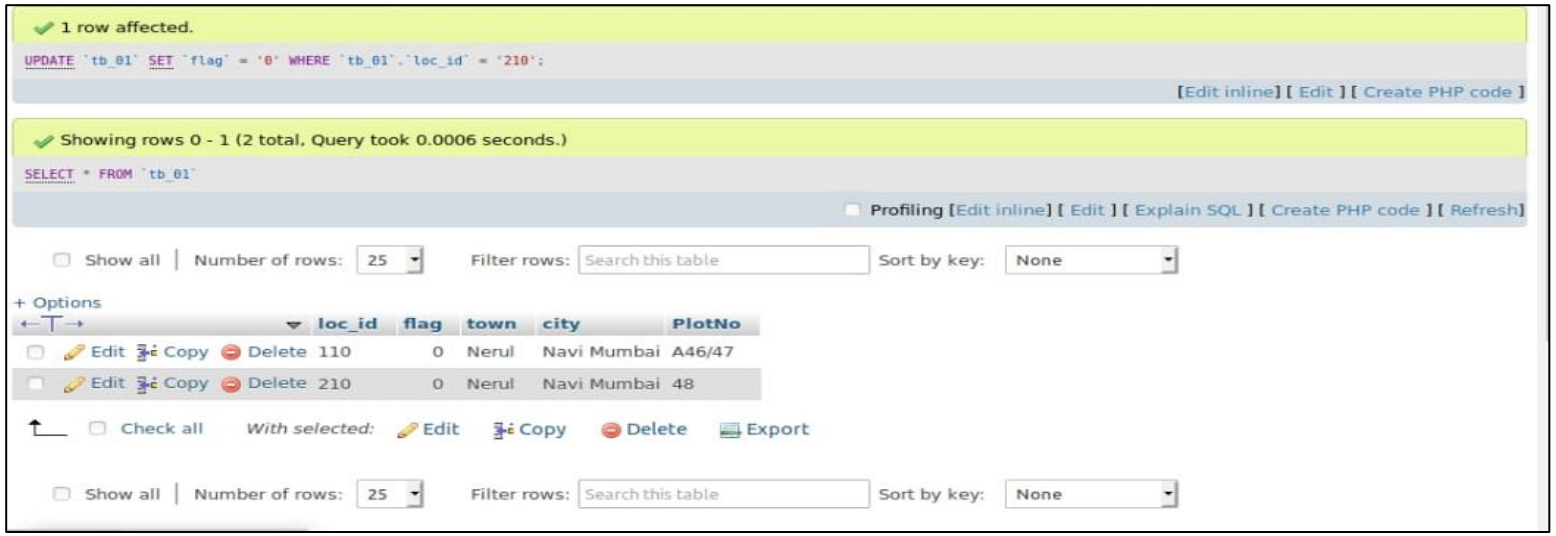


Fig.14 Database showing the status of the bin

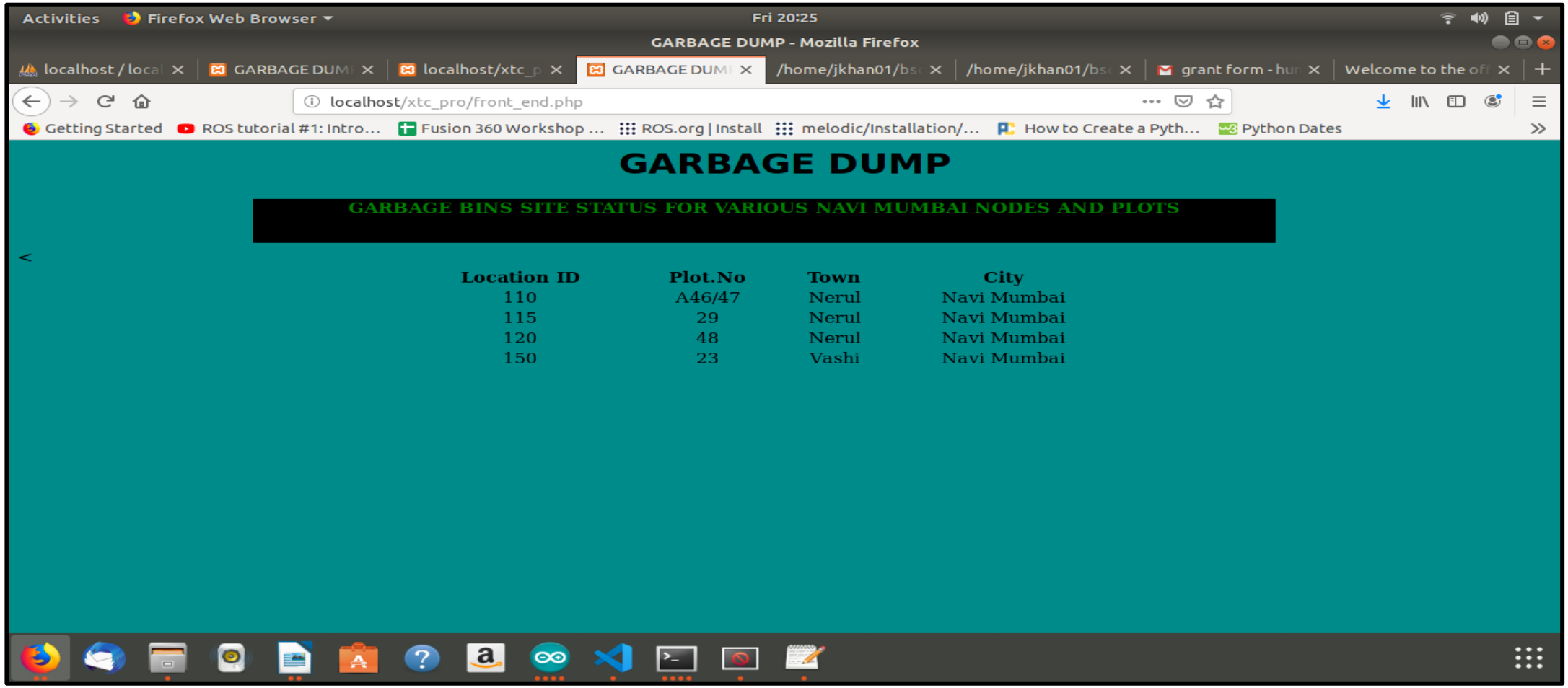


Fig. 15 Webpage for Central Monitoring

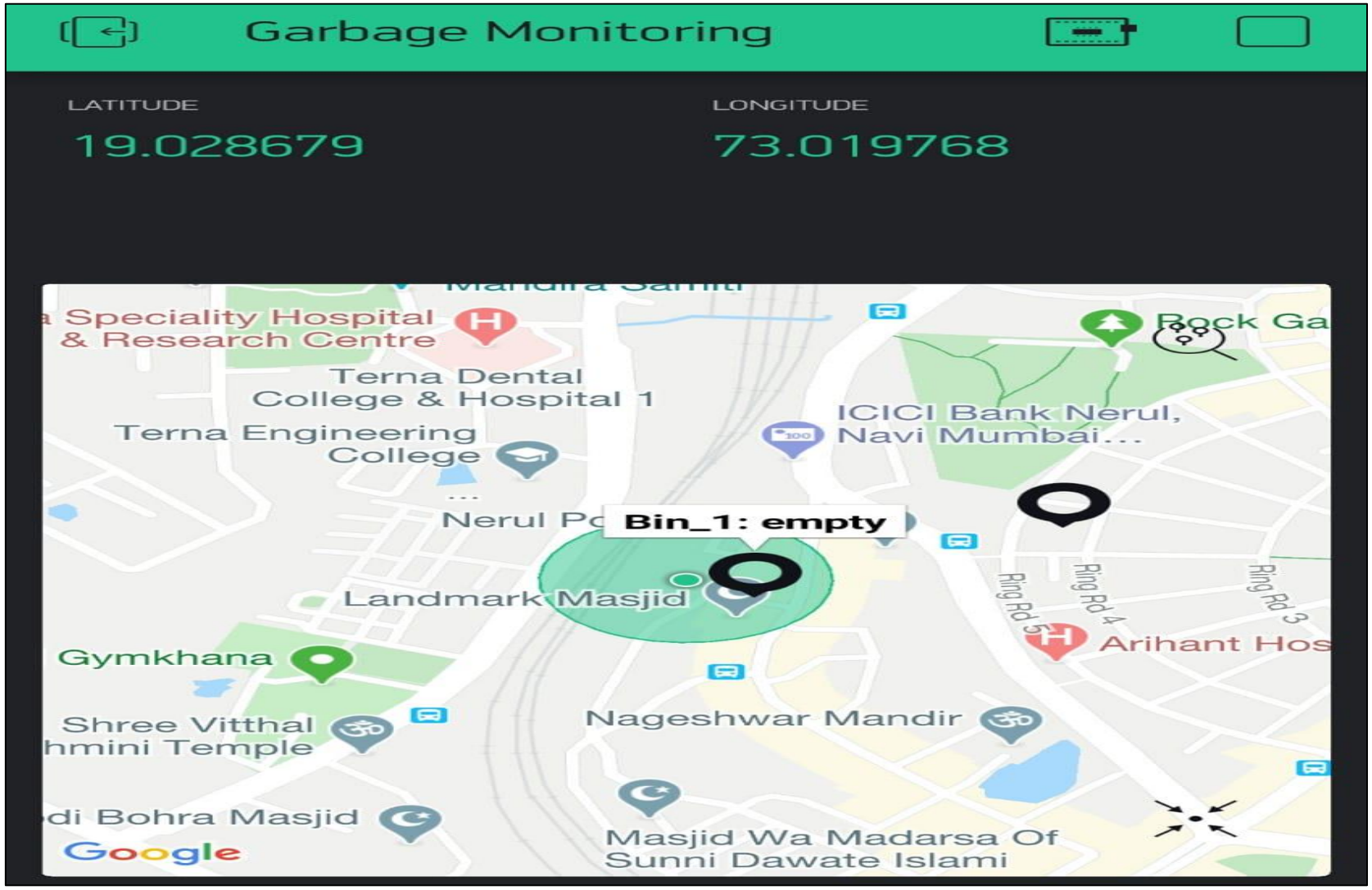


Fig.16 Application for monitoring garbage

Summary & Conclusion

5.1 Summary

- The project is built to increase the efficiency of garbage collection and monitoring.
- The garbage level monitoring will help to reduce the fuel wastage and also, make sure that the waste is collected from all the places at the right time.
- The segregation system will help to classify the waste into wet and dry wastes - all of which undergo different treatment procedures for proper disposal.

5.2 Conclusion

The conclusion that can be drawn from the results are:

- The system is made for monitoring the waste which is useful for saving the fuel of the trucks and also helps in efficient collection of the garbage.
- The monitoring system sends a message regarding the status of the dustbin.
- With the help of web page designed, the authorities will be able to do the central monitoring of the system.
- An app is designed for finding the location of the bins and knowing their status.

5.3 Future Scope

- More functions and features can be added to the existing system. Some of them are as follows:
- Adding more features to the website such as date and timing for when the bin was last emptied.
- Waste can be segregated into biodegradable and non-biodegradable, or recyclable and nonrecyclable, or metallic and non-metallic etc.

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[3] Sonal Chakole, Priya Khadse, Shruti Shinganjude, Prajakta Pimple, Snehal Shahne, Shweta Mokhale. *Real Time Smart City Garbage Collection and Monitoring System Using GSM and GPS*. International Research Journal of Engineering and Technology, Vol.4, March 03, 2017.

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ACHIEVEMENTS

- Participated in Paper Presentation in ICESD 2020 at Jadavpur University, Kolkata.
- Secured 1st prize in TPP in TECHNICIA 2020 at Amity University, Mumbai.
- Participated in TPP in SPECTRA 2020 at SPCE, Andheri.
- Participated in TPP in TECHXTER 9.0 at SIES, Nerul.

ICESD 2020

INTERNATIONAL CONFERENCE ON ENERGY AND SUSTAINABLE DEVELEOPMENT
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FEBRUARY 14-15, 2020

CERTIFICATE

OF ATTENDENCE / ORAL PRESENTATION

THIS CERTIFICATE IS PRESENTED TO

Humera Khan

Paper Title: Smart Garbage Monitoring System

Prof. Gautam Majumdar
(HOD, Mechanical Engineering Department)
(Jadavpur University)

Prof. Himadri Chattopadhyay
(Conference Secretary)

AMITY UNIVERSITY
MUMBAI

Amity School of Engineering & Technology
&
Amity Institute of Technology

TECHNICIA 2020

23rd and 24th January

CERTIFICATE

This is to certify that ~~Mr~~/Ms HUMERA KHAN
of Fr.C. RODRIGUES INSTITUTE OF TECHNOLOGY ~~participated~~/Secured position 1st – TECHNICAL PAPER PRESENTATION that was held in Technicia-2020 on 23rd and 24th January 2020 at Amity University Mumbai.

FACULTY CO-ORDINATOR
TECHNICIA-2020

DIRECTOR
ASET & AIT

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&
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TECHNICIA 2020

23rd and 24th January

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of Fr.C. RODRIGUES INSTITUTE OF TECHNOLOGY ~~participated~~/Secured ~~position~~ 1st POSN – TECHNICAL PAPER PRESENTATION that was held in Technicia-2020 on 23rd and 24th January 2020 at Amity University Mumbai.

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TECHNICIA-2020

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SIES Graduate School Of Technology, Nerul, Navi Mumbai

Certificate of Participation

This is to certify that Mr./ Ms. Khan Humera has participated in Techxter 9.0, a National Level Technical Paper Presentation Competition held on February 29, 2020 at SIES Graduate School of Technology, Nerul, Navi Mumbai.

Prof. Leena Ladge
ISF Co-ordinator

Dr. K. Lakshmisudha
HoD

Dr. Atul Kemkar
I/c Principal

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HoD

Dr. Atul Kemkar
I/c Principal

Mapping Course Outcomes with Program Outcomes

Table shows mapping of course outcomes with program outcomes.

(Note: 1: Slightly 2: Moderately 3: Substantially If there is no correlation the cell to be left blank or put -)

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	2	-	-	-	-	-	-	-	-	-	-
CO3	-	-	3	-	-	-	-	-	-	-	-	-
CO4	-	-	-	3	-	-	-	-	-	-	-	-
CO5	-	-	-	-	2	-	-	-	-	-	-	-
CO6	-	-	-	-	-	3	-	-	-	-	-	-
CO7	-	-	-	-	-	-	3	-	-	-	-	-
CO8	-	-	-	-	-	-	-	3	-	-	-	-
CO9	-	-	-	-	-	-	-	-	3	-	-	-
CO10	-	-	-	-	-	-	-	-	-	3	-	-
CO11	-	-	-	-	-	-	-	-	-	-	2	-
CO12	-	-	-	-	-	-	-	-	-	-	-	3

THANK YOU