# SMART GARBAGE ALERT SYSTEM USING MACHINE LEARNING

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**ABSTRACT** Now a day, Waste management is one of the primary problem that the world faces irrespective of the case of developed or developing country. The key issue in the waste management is that the garbage bin at public places gets overflowed well in advance before the commencement of the next cleaning process. It leads to various hazards such as bad odour & amp; ugliness to that place which may cause for spread of various diseases. To avoid all such hazardous scenario and maintain public cleanliness and health our project is mounted on a smart garbage system. The main aim project is to develop a smart intelligent garbage alert system for a proper garbage management. The main aim project is to develop a smart intelligent garbage alert system for a proper garbage management. Our project proposes a smart AI dustbin which is Collect the Real time dataset of what's in the Garbage and Classify the Waste. Prepare the Dataset for an Image classification. Train the Neural Network and Create a Tensor Flow Model and Deploy the Model. After it is also interfaced with hardware using ultrasonic sensor. The sensor values are read and the values are displayed in the LCD. Hence, garbage management is done by using both image processing and embedded system. Based on the image processing output, the respective degradable and non-degradable dustbins are opened by showing relay operations.

## 1. INTRODUCTION

The main aim of this work is to develop a smart intelligent garbage alert system for a proper garbage management**.** We proposes a smart AI dustbin which is Collect the Real time dataset of what's in the Garbage and Classify the Waste. Prepare the Dataset for an Image classification. Train the Neural Network and Create a Tensor Flow Model and Deploy the Model. After it is also interfaced with hardware using ultrasonic sensor. The sensor values are read and the values are displayed in the LCD. Hence, garbage management is done by using both image processing and embedded system. Based on the image processing output, the respective degradable and non-degradable dustbins are opened by showing relay operations. Waste management is one

of the primary problem that the world faces irrespective of the case of developed or developing country. The key issue in the advance before the commencement of the process. It leads to various hazards such as bad odour, ugliness to that place which may cause for spread of various diseases. To avoid all such;hazardous scenario and waste management is that the garbage bin at public places gets overflowed well in

maintain public cleanliness and health our project is mounted on smart garbage system.

## 2. MATERIALA AND METHODS

### A. Performance Requirements

The application at this side controls and communicates with the following three main general components. embedded browser in charge of the navigation and accessing to the web service; Server Tier: The server side contains the main parts of the functionality of the proposed architecture. The components at this tier are the following. Web Server, Security Module, Server-Side Capturing Engine, Preprocessing Engine, Database System, Verification Engine, Output Module.

### B. Safety Requirements

1. The software may be safety-critical. If so, there are issues associated with its integrity level

2. The software may not be safety-critical although it forms part of a safety- critical system. For example, software may simply log transactions.

### C. Data Flow Diagram

1. The DFD is also called as bubble chart. It is a simple graphical formalism that can be used to represent a system in terms of input data to the system, various processing carried out on this data, and the output data is generated by this system.

2. The data flow diagram (DFD) is one of the most important modeling tools. It is used to model the system components. These components are the system process, the data used by the process, an external entity that

interacts with the system and the information flows in the system.

3. DFD shows how the information moves through the system and how it is

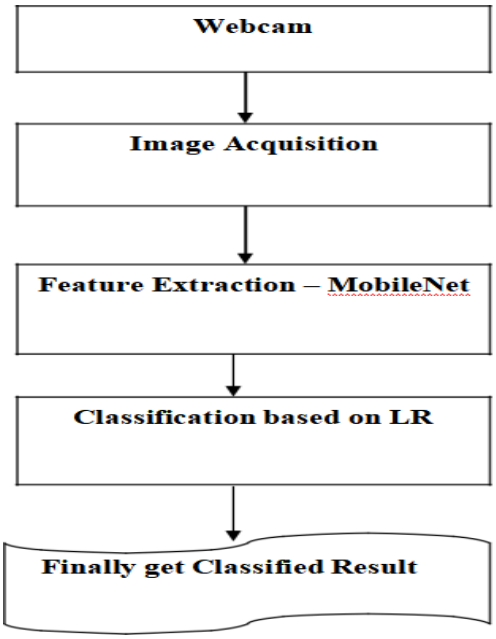
modified by a series of transformations. It is a graphical technique that depicts information flow and the transformations that are applied as data moves from input to output.

4. DFD is also known as bubble chart. A DFD may be used to represent a system at any level of abstraction. DFD may be partitioned into levels that represent increasing information flow and functional detail.ntegrity level and if the software is shown to be of that integrity level, then the hardware must be at least of the same integrity level. 4. There is little point in producing 'perfect' code in some language if hardware and system software (in widest sense) are not reliable.

5. If a computer system is to run software of a high integrity level then that system should not at the same time accommodate software of a lower integrity level.

6. Systems with different requirements for safety levels must be separated.

7. Otherwise, the highest level of integrity required must be applied to all systems in the same environment.



## 3. RESULTS AND DISCUSSIONS

### 1. Image acquisition

Image acquiring is important stage in image processing.

Testing image is capturing from Web cam for further process.

### 2. Feature Extraction:

After the image acquisition, we propose the feature extraction to captured image. In that, we implement deep learning network model like mobile net for feature extraction. It extracts the high level features to image for efficient classification.

### 3. Classification

The final stage is classification. In that our test Image classified into two categories i.e. Degradable and non-degradable.

For Classification, we propose the logistic regression (LR) machine learning method.. The machine algorithm identifies the degradable and non-degradable waste and intimates to the controller then the controller ON the respective relay. There are two relays in the hardware, one for degradable and other for non-degradable. The ultrasonic sensor is used for the identification of the level of the dustbin and if the dustbin is full then buzzer will be alerted. The levels are displayed in the LCD.

### 4. Coding And Testing

Once the design aspect of the system is finalizes the system enters into the coding and testing phase. The coding phase brings the actual system into action by converting the design of the system into the code in a given

programming language. Therefore, a good coding style has to be taken whenever changes are required it easily screwed into the system.

Coding standards are guidelines to programming that focuses on the physical structure and appearance of the program. They make the code easier to read, understand Program should be simple, clear and easy to understand. Naming conventions Value conventions and maintain.

This phase of the system actually implements the blueprint developed during the design phase. The coding specification should be in such a way that any programmer must be able to understand the code and can bring about changes whenever felt necessary. Some of the standard needed to achieve the above-mentioned objectives are as follows:

## 4. CONCLUSION

A major challenge in waste management is waste disposal which requires segregation of waste into degradable and non degradable categories. Recent advances in computer vision made possible by deep learning has paved the way for AI assisted waste management .This model has certain lacks implementing for bigger bins may be complex, initial implementation may be complex. But this model serves good for segmentation of waste.

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