A Survey on Garbage Management System

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Abstract: In modern times, disposal of garbage has turn out a huge cause for concern in the world. A comprehensive amount of waste that is generated is not disposed properly and in turn have a harmful effect on the habitat. The most commonly used method for disposal of the waste is by random and unscientifically dumping garbage at landfill sites, which is creating problems to public health and the environment. Garbage disposal is an emerging environmental and public health issue. Waste production has been doubled over a period of past 20 years and the efficiency in manual segregation is very low. Thus, a practicable answer to this problem is by segregating waste at the root stage. The paper briefs to classify the waste into basic categories that is bio-degradable and non – biodegradable wastes. The wastes are detected and dropped into the respective bins allocated to each category where these classified wastes can be taken ahead for efficient recycling. The whole system is designed to get maximum efficiency of work and make our environment safer.

Keywords: Biodegradable waste; Non-Biodegradable waste; IR sensor; Camera; Waste Segregator

I. INTRODUCTION

Garbage Segregation Management is the biggest challenge for majority of the countries all over the world especially in urban areas. It is a global issue that all living species are affected by. It has become a considerable issue in past decade due to garbage and pollution. More specifically, humans have been dumping plastics and other waste into landfills, oceans to create these massive garbage patches in them.

Waste segregation system is a precondition in order to safeguard the clean and green habitat as there is spreading of all wide variety of waste disposal methods. Waste disposal is an ongoing global environment and health care concern, as this waste is more quickly growing part of any municipal waste stream.

The huge amount of waste that gets generated is disposed in an unpleasant way that effects our environment due to improper waste management. The prevailing garbage disposal system in India consists of unorganized methods in the collection of waste. The waste segregation is carried out with the help of manual workers. The efficiency in manual segregation is very low and may cause many health issues for the laborers and is time consuming process. The chances of a waste material being classified incorrectly are high due to human error. An effective strategy for managing waste has to start with segregation of waste at the source of generation.

Thus, a genuine attempt to handle the future disaster need to be regulated for reducing waste generation, and also its effective dumping, containing primary collection, separation, and then reprocessing with appropriate technology to reduce their harmful effects.

Our aim is to segregate the collected waste into two categories of bio-degradable wastes and non-biodegradable wastes. So, when the unwanted garbage is discarded in two different dustbins at the source itself which in turn allows effective treatment and disposal. So, the efficient garbage management administration makes the garbage collection productive.

II. LITERATURE SURVEY

The below list outline survey of papers related to the topic in brief with possible limitations/drawbacks within the proposed system.

The findings have been tabulated in Table 1.

Paper	Description	Drawback
Automatic Garbage Separation Robot Using Image Processing Technique [1]	In this system the ultrasonic sensor is used by the robot to detect the waste automatically by sensing the waste with the help of a webcam which uses the technique of image processing. The separation of waste is done by using Embedded C technique which helps in arm and gripper movement of robot, and this is done by looking into various aspects of various aspects of image processing technique.	The Robot had Limited functionality and lesser work was done regarding the interfacing of modules.
Centralized Waste Segregation System [2]	The project here aims to design a system which can collect and segregate the wastes. It is an embedded platform which can monitor the filling level of the recycling bins, and to dispose the waste automatically.	The System here identifies only the metallic waste.
Automatic Waste Segregator [3]	This system can segregate wet, metal, plastic and paper with the help of two discs, one rotating and the other stationary. The attachment of all the sensors is done with the help of Arduino UNO. The infrared Proximity sensor is used to mark the trash that is stored and moves forward towards sensor which is in the chain as per the design and the code within Arduino.	Proportion of the trash must fit the slot size as well as thickness of the trash need be minimum. The separation of non-transparent plastic is impossible considering the weakness of optical device.
Smart Garbage Collection System [4]	This system is placed on the top of garbage collection vehicle which shows the filled-level of garbage collected in vehicle. Stereoscopic Camera is used for capturing two simultaneous images and then it will proceed further for depth measurement. From this it is possible to know the garbage available in the vehicle is full or empty.	The message cannot be sent to unknown number or it can't get any reply back from unknown telephone number.
Garbage Management System for Smart City Using IOT [5]	In this system, the person can get to know at what time the trash bin is full and when the waste should be collected from the trash bin with timestamp of real-time clock. It also indicates the presence of poisonous gases in the bin by alarm sound. It automatically cleans the trash bin with the force of water when the trash bin is empty.	There is no proper segregation of waste in the trash bin.
Smart Bin-Automatic waste segregation and collection [6]	The waste is segregated into dry and wet waste without human intervention. If the bins are filled to 80% of its capacity, IR device detects that the sub- bins which are nearly full, thereby buzzer alarm is activated and SMS is sent to the user.	Only light-weighted waste materials are used to segregate.

Automatic Waste Segregator as an integral part of Smart Bin for waste management system in a Smart City [7]	The waste can be dumped on either of the sides (has two compartments consisting of sensors) and left compartment is dedicated to dry and right for wet wastes. If waste is dumped on wrong side, then the waste is flipped to the respective compartment using the motors.	Usage of same sensors on the both the compartments could be minimized by changing the design.
Capsule Neural Networks and Visualization for Segregation of Plastic and Non-Plastic Wastes [8]	Simple hardware setup runs using motor and for waste segregation uses capsule- Net. The setup has webcam mounted at the top to view the waste materials. Dataset was tested with both CNN and Capsule Net but Capsule Net gave better accuracy for smaller dataset too.	The system was tested for very limited dataset.
Waste Profiling and Analysis using Machine Learning [9]	Android application is able classify the captured garbage images into non-biodegradable and biodegradable in which analysing images has done with machine learning using tensor flow.	Less Accuracy.
Automatic plastic waste segregation and sorting using deep learning model [10]	Recognition and detection of the bottles has been done using deep learning algorithm. The deep learning framework was more accurate and gave a good result for bottle identification.	The system only focuses on segregation of plastic bottles.

Table 1. Survey

III. EXISTING SYSTEM

Industrialization, modernization, quick progress and growth in population have led to large amount of waste. The existing garbage disposal system in India consists of unorganized methods in the collection of waste. Dearth due to inappropriate disposal methods in the country has led to the problem of garbage collection, which causes waste to randomly lie in the vicinity, placed in open areas and become the main home for various types of pathogenic bacteria and viruses that is why waste management is of vital importance.

Segregation makes it feasible to reuse and recycle the garbage waste that has been produced. The segregation is done by rag pickers which may cause many health issues for the labours and is time consuming process. This becomes main reason for generation of large amount of garbage. Garbage management is mainly concerned about the public hygiene and welfare of the society. In the present days the waste segregation is done manually by installing various types of smart bins for collecting different type of garbage waste such as wet, dry, plastic and metal etc. Because of the inadequacy in segregation of waste, large quantity of untreated waste is accumulated and it is dumped at landfills.

Outlay on garbage disposal, manual labour required for waste segregation and the waste could be easily recycled, reused and reduced. Uncontrolled dumping of waste impossible to reclaim and may cause harmful effects on the environmental which may also contribute to Global warming. Due to this the average life span of the rag pickers reduced as well.

In the existing Garbage management system mostly concentrate on monitoring the waste rather than managing the waste. The system here detects the existence of garbage and the amount of waste present in the bins. If the waste is detected, the messages is sent to the concede department using Global System for mobile communications (GSM) which is moderate in communication compared to the other system. The Segregation of waste is only done to the waste materials such as metallic and non-metallic, wet and dry wastes. The main disadvantage is that the information is not sent in actual time, the metallic wastes is separated and the waste such as plastic and bio waste is separated as non-metallic wastes, Moisture sensor will detect the wet waste in minute presence of water content.

IV. PROPOSED SYSTEM

The purpose of this system is to give a solution that can detect, identify and segregate garbage into categories of Biodegradable and Non-Biodegradable garbage waste using machine learning approach.

V. CONCLUSION

After doing this dissertation and going through all the studies. We conclude there is still lack of compliance of garbage waste management in the practical field. As the

segregation of waste at the time of generation is not done properly will lead to risk of infections and affects the public health.

So, there is a special need of introducing various new technologies in segregation of waste management to reduce the human intervention. So, our efforts intended to build an efficient garbage segregator with the help of conveyor belt that can separate garbage waste into their respective bins as Bio-degradable and non-Bio-degradable. The model can be used for effective management of garbage collection and disposal, and help in reducing time taken to collect and dispose solid waste.

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