

Smart Garbage Monitoring and Management System

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Abstract: The traditional waste management system can be replaced the system to perform real time monitoring and allow for better waste management. The aim of this research is to develop a smart waste management system using a smart sensor which manages the overflow of the garbage from the dust bins. It performs real time garbage monitoring and classification. The bin consists of Arduino, Ultrasonic Sensor, and Servo Motor, where the lid of the dustbin will automatically open itself upon detection of human hand. The smart dustbin is a carefully designed solution that solves the social issue of waste disposal; the smart dustbin identifies the kind of material being thrown inside it and segregates it into bio or nonbiodegradable

KEY WORDS: Smart Bin, Arduino, Ultrasonic Sensor, Servo Motor , Buzzer

I. INTRODUCTION:

Dustbins (or Garbage bins, Trash Cans, whatever you call them) are small plastic (or metal) containers that are used to store trash (or waste) on a temporary basis. They are often used in homes, offices, streets, parks etc. to collect the waste. In some places, littering is a serious offence and hence public waste containers are the only way to dispose small waste.

In this project, I have designed a simple system called Smart Dustbin using Arduino, Ultrasonic Sensor, and Servo Motor, where the lid of the dustbin will automatically open itself upon detection of human hand. The smart dustbin is a carefully designed solution that solves the social issue of waste disposal; the smart dustbin identifies the kind of material being thrown inside it and segregates it into bio or nonbiodegradable

II. LITERATURE SURVEY:

Waikhom Reshmi, RamKumarSundaram, M.RajeevKumar: [1]This paper focuses on environmental degradation as well as health impact of people caused by inadequate disposal of waste can be expressed by the contamination of surface and ground water through direct waste contacts, air pollution by burning of wastes, spreading of diseases by different vectors like birds, insects and rodents, or uncontrolled release of methane by anaerobic decomposition of waste.

KellowPardini, Ashok Kumar Das,JoelJ.P.C.Rodrigues,Victor Hugo.C Ousmane Diallo, SergeiA.koziov:[2]This paper proposes an efficient and real-time waste management model for cities,

focused on a citizen perspective. The proposed system includes sensor technologies where waste information is collected from the smart bin (things), in real-time, and then transmitted, through the Internet, to an online platform where citizens can access and check the availability of the compartments scattered around a city

Md.WahidurRahman,RahabulIslam,ArafatHasan,NasimaIslamBithi,Mohammad Motiur Rahman: [3]This paper works on Machine Learning (ML) refers to a significant function of Artificial Intelligent (AI) that allows a system the ability to learn and make the decision automatically without being explicitly instructed. Machine learning is a scientific study of some statistical models and algorithms.

Dr. Khanna SamratVivekan,Omprakash : [4]This paper focuses on Wireless systems which are necessary for many people nowadays. A security system can offer protection for the entire family and property of a home. It also acts as a great deterrent for criminals and lowers your home insurance rates. These wireless security camera systems are designed to protect your property and belongings, and these security cameras allow you to remotely watch them from wherever you are. The right wireless antenna makes a big difference in the performance of your wireless surveillance application. The benefit of Wireless will be the lack of annoying wires and cords all around us. Cables often are a hassle and a good way to mess up the infrastructure of your property.

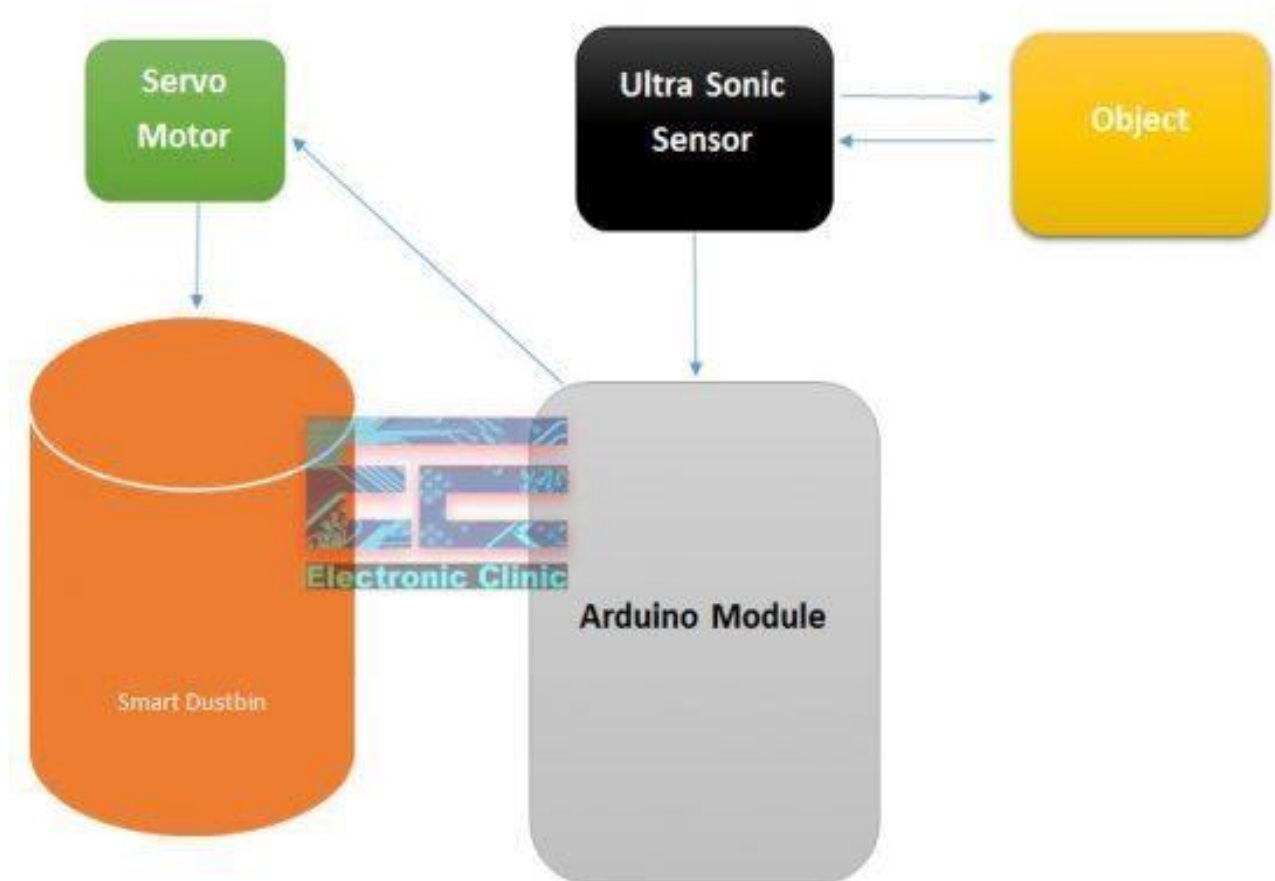
Amol V.Nagime,Patange A.D:[5]This paper explains the CCTV based surveillance which has developed from simple systems comprising a camera connected directly to a viewing screen with an observer in a control room, watching for incidents of crime or vandalism or searching for targeted individuals, to complex multi camera systems with many computers. The use of a surveillance system for image detection is becoming more important. An embedded surveillance system is frequently used in the home, office or factory for image processing of the surveillance system and also for traffic monitoring but this configuration requires a high performance core, which works against some advantages of embedded systems, such as low power consumption and low cost. Some designs propose the use of different sensors to track the sequence of the human body movement.

Quist-Aphetsi Kester : [6] This paper explains the Private surveillance activities, visual evidence gathering, intrusion detection are among the important reasons for the adoption of surveillance camera sensor networks. Image processing techniques have helped over time in making images easily track able and objects easily indefinable. Yet most of these devices and applications come at a cost. Damage to these devices may render both the application software and the devices not usable. Deployment of such devices with sensing techniques may come at a very high cost for homes and institutions and these make it very costly and replacement of old monitory system are needed for the new one to be implemented. Hence solutions are needed to make these old and new camera monitory systems more effective and monitory and surveillance activities

OlfaKanoun : [7]This paper explains the kernel of a sensor system is the sensor element, which changes its output depending on the measured quantity .In a preprocessing unit, the sensor signal is transformed in an

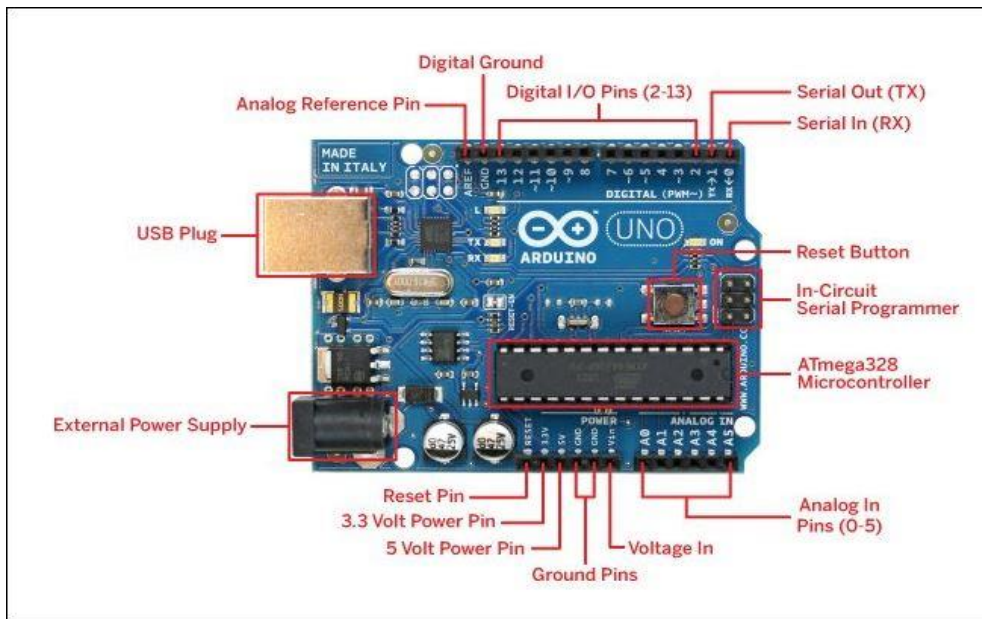
adequate amplified and filtered signal using analog signal processing techniques. Using digital signal processing, the measured quantity can be calculated under consideration of manufacturing variance, influence factors, and aging processes.

III.SYSTEMDESIGN:

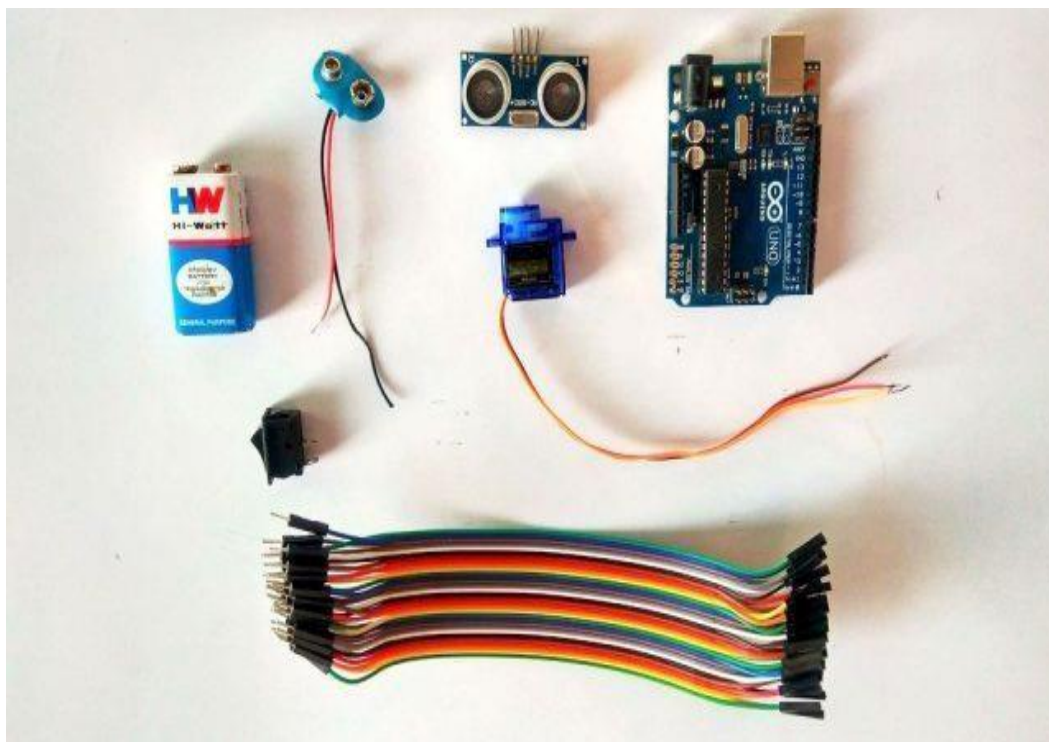


Arduino UNO R3:

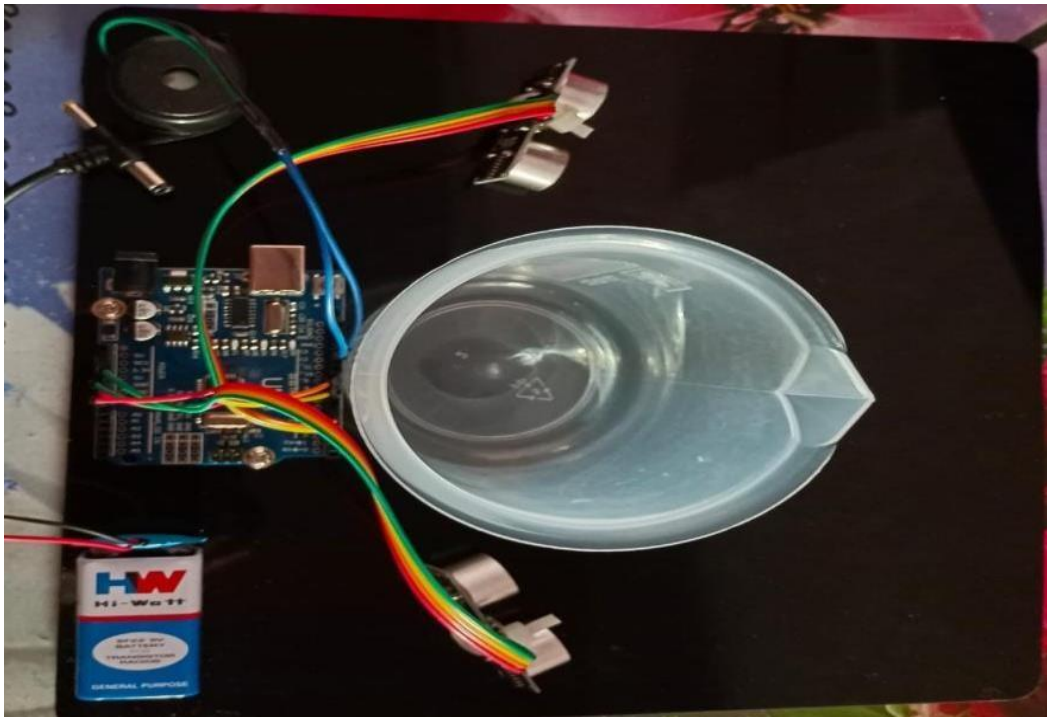
Arduino Uno R3 is one kind of ATmega328P based microcontroller board. It includes the whole thing required to hold up the microcontroller; just attach it to a PC with the help of a USB cable, and give the supply using AC-DC adapter or a battery to get started. The term Uno means “one” in the language of “Italian” and was selected for marking the release of Arduino’s IDE 1.0 software. The R3 Arduino Uno is the 3rd as well as most recent modification of the Arduino Uno. Arduino board and IDE software are the reference versions of Arduino and currently progressed to new releases. The Uno-board is the primary in a sequence of USB-Arduino boards, & the reference model designed for the Arduino platform.



OUTPUT:



The above picture represents the sensors and the hardware tools which are required to working of the smart bin.



The above picture represents the working of the smart bin with the all requirements attached to it. When the garbage is thrown outside the bin then the buzzer will give the warning.

Conclusion:

We added a sensor technology for the garbage monitoring, so the garbage stored in the bins will not be overflowed from the bin. The trash in the bin will be remotely monitored whenever the garbage is thrown into the bin. By this technology we can conclude that in future the garbage will be stored inside the bins rather than throwing the garbage outside the bin. Whenever the garbage is thrown out of the bin the buzzer will be active and gives a buzzer sound.

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