

Smart Dustbin Using ARDUINO, Ultrasonic Sensor & Servo Motor

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Abstract - Mostly in our daily life we encounter dustbins that are excessively full and garbage spilling out of them. This kind of situation is neither good for our environment nor for our advancement. This problem leads to huge number of diseases as large number of insects and mosquitoes breed on the waste accumulated in this garbage. Hence, we developed a project to control the overflowing of the dustbin by making the dustbin smart enough to notify itself for its cleaning. In this project the smart dustbin management system is built on the microcontroller based system having ultrasonic sensors on each of the four dustbins that will show the current status of garbage on the LCD screen as well as on the mobile.

Keywords - ATMEGA328P, Ultrasonic Sensor, ESP8266, IR Sensor, PIR sensor

I. INTRODUCTION

In this project, I will show you How to Make a Smart Dustbin using Arduino, where the lid of the dustbin will automatically open when you approach with trash. The other important components used to make this Smart Dustbin are an HC-04 Ultrasonic Sensor and an SG90 TowerPro Servo Motor.

II. LITERATURE SURVEY

Since smart cities are becoming centre of attraction for the advancement of developing countries and without the removal or solution to the garbage problem these cities will be not that attractive. Therefore, large number of projects and research is going on in the area of smart dustbins for smart cities and to implement such projects typically use microcontroller based real time bin monitoring system, RFID technology, GPS, GSM, RF module etc. Yusof et al. [2], presented an Arduino Uno micro controller based smart garbage monitoring system to ascertain the level of waste in the garbage bin in real-time and before there is overflow in garbage bin the system sense out and alert through SMS municipality for the bin to be emptied an garbage to be collected immediately.

III. COMPONENTS AND METHODS

- Concept behind Smart Dustbin using Arduino
- How to Build a Smart Dustbin using Arduino?
- Connecting the Servo
- Connecting the Ultrasonic Sensor
- Wiring up the Components
- Circuit Diagram
- Components Required
- Code
- Working
- Output Video
- Conclusion

IV. RESULTS AND DISCUSSION

In this 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. Usually, it is a common practice to use separate bins for collecting wet or dry, recyclable or non-recyclable 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 two LDR's are placed at the two sides of solar panel and the Servo Motor is used to rotate the solar panel. The servo will move the solar panel towards the LDR whose resistance will be low, mean towards the LDR on which light is falling, that way it will keep following the light. And if there is same amount of light falling on both the LDR, then servo will not rotate. The servo

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will try to move the solar panel in the position where both LDR's will have the same resistance means where same amount of light will fall on both the resistors and if resistance of one of the LDR will change then it rotates towards lower resistance LDR. Check the Demonstration Video at the end of this Article.

V. RESULTS AND DISCUSSION

To make the prototype, you will have to follow the below steps:



Fig. 1. Experimental Kit Diagram

VI. CONCLUSION

In Proposed system, the implementation of smart dustbin management system using IOT as a hardware and ionic framework as our software insures the cleaning of dustbins soon when the garbage level reaches its maximum. If the dustbin is not cleaned in specific time, then the record is sent to the higher authority in our case the admin who can take appropriate action against the concerned employee.

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