Project Report

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IoT Based Smart Dustbin System for Contactless Waste Disposal Using Arduino Uno

Objectives:

1. To develop an automated dustbin that opens the lid using a servo motor and ultrasonic sensor.
2. To promote contactless and hygienic waste disposal.
3. To use Arduino Uno for real-time control and sensing.

Components Required:

Sno	Name of Component	Qty.
1.	Arduino Uno	1
2.	Ultrasonic Sensor (HC-SR04)	1
3.	Servo Motor	1
4.	Jumper Wires	15
5.	Breadboard	1
6.	Power Supply (Battery/USB)	1

Details of Components

1. Arduino Uno :

A microcontroller board based on the ATmega328P. It is used to control the components and execute the logic of the smart dustbin.

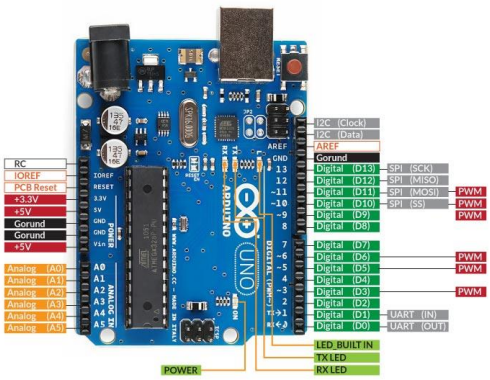

Figure 1 : Arduino Uno

2. Ultrasonic Sensor:

It detects the presence of a hand/object near the dustbin using sound waves and sends the signal to Arduino.

Block Diagram of Designed Model:

Explanation of Block Diagram

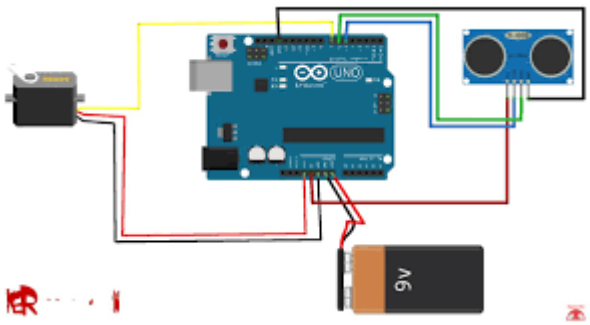

Figure 2 : Block Diagram of Model

Explanation of Block Diagram

1. The ultrasonic sensor detects motion within a certain distance.
2. This signal is sent to the Arduino Uno.
3. Arduino processes the input and sends a command to the servo motor.
4. Servo motor opens the dustbin lid automatically.
5. After a few seconds, the lid closes automatically.

Working of Designed Model:

• When an object or hand is detected within 10-15 cm of the sensor, it sends a signal to the Arduino.
• The Arduino processes this data and sends a command to the servo motor.
• The servo motor rotates 90 degrees to open the lid.
• After a delay of a few seconds, the lid closes automatically.
• This system ensures hygienic, contactless waste disposal.

Pictures of Prototype and Output:

Learning Outcomes (What I have learnt):

1. How to interface an ultrasonic sensor and servo motor with Arduino.
2. Basics of IoT and sensor-based automation.
3. Writing and uploading Arduino code for hardware control.