

# Smart Dustbin

**Objective** - The objective was to make a dustbin which can separate waste in 2 different categories and put them in corresponding areas of dustbin.

## **Approaches -**

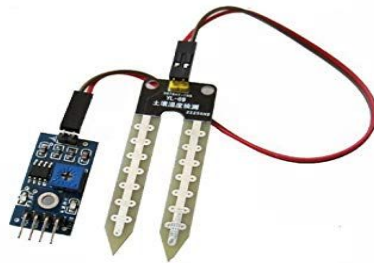
### **1)For the classification of waste-**

**a)**The first approach was to use a Raspberry Pi camera to take images of waste and then classify it into dry or wet waste using a deep learning model.

### **Problems faced -**

- 1)We needed a huge dataset of the images of waste materials, which was not available.
- 2)Time for predicting waste as dry or wet waste was quite large.

**b)**The second approach was to use sensors that can detect whether the waste is dry or not. Moisture Sensors were used for that (Fig1)



**Fig 1**

( Fig1 -Moisture Sensor - moisture sensors are designed to **estimate volumetric water content based on the dielectric constant (bulk permittivity).**)

We set a threshold by observing different kinds of waste material. And then used that threshold to classify the waste.

### **Problems faced -**

- 1)It classified wet polythene as a wet waste(which is originally a dry waste).

To solve this problem we used 3 moisture sensors and took the mean value. The waste is rotated at a high speed during the measuring of moisture content so that moisture content of most of the part of waste can be measured and we can get a mean value.

Due to some weight problem Dustbin was not able to put the waste into a part of the dustbin for the corresponding category of waste. This problem can be solved by using more powerful servo motors, fewer wires, and a better design.

### **Components Used -**

- 1)Arduino nano
- 2)Servo motors(for separation of waste )
- 3)Moisture Sensor
- 4)Ultrasonic sensor(to detect the presence of waste)

### **Team Members -**

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