

Domain: Automation

Problem Statement

Nowadays, poor waste management has caused an increase in landfilling and dumping sites that instigated pollution and a waste of recyclable materials that can be used for recycling or remanufacturing. Most people aren't aware about which category the waste should be classified and dumped into, especially the younger generations(kids). And the fast-paced life of people doesn't help either. Even Though measures have been taken for waste segregation by having multiple bins , it has proven ineffective due to the above drawbacks.

Litter is any kind of trash thrown in small amounts, especially in places where it doesn't belong. With time, it heaps up. The practice is unlawful because it costs municipalities millions of dollars annually in cleanup costs. It also portrays a bad picture of an area.

This is a big problem especially in public places, organizations, societies as people don't care about other places like they do for their homes. So how do we help them and promote waste disposal and management??

Solution

AutoBin!

The method approached to solve this issue is waste classification using computer vision. We will be using Trashnet dataset to classify the waste using deep learning. As mentioned in the problem statement people find it harder to classify and dump waste, we are automating this process by using computer vision to classify and segregate the waste into different compartments of the same AutoBin(Dustbin). This uses inbuilt cameras and sensors to first detect the waste and accordingly segregate it. This model is feasible as it completely runs on solar power, but could also be tweaked to run on AC supply.

Also our AutoBin also has all the features of a Smart Dustbin like fill-level detection, Fleet Management Platform etc. With this solution attempted, the waste management system is taking its first steps into a successful system to achieve a sustainable environment for the present and the years to come.

Tech Stack

- 1) Deep learning using python programming and RESNET50
- 2) SolidEdge For 3D model of the prototype
- 3) Embedded C for Arduino IDE/Raspberry Pi
Hardware requirements for live prototype
- 4) Sensors(Moisture sensor, ultrasonic sensor, servo motor, motion sensor, camera module)