

# **ARTIFICIAL INTELLIGENCE DUSTBIN**

## **Observation:**

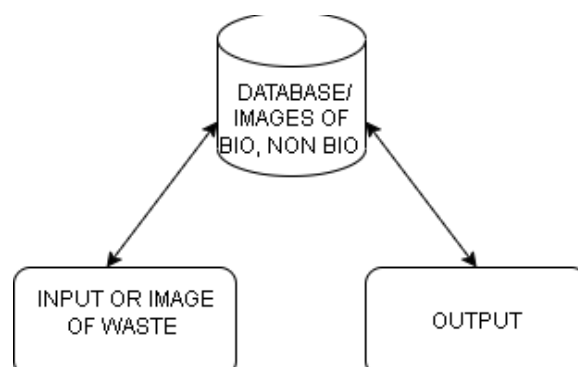
According to stats Pollution is becoming a very big problem day by day and one of the main causes of this problem is wrong waste segregation. Improper segregation of waste has a very negative impact on Environment. This also affects our health like Lung Disease, Skin Irritation, Heart Problem, etc. As some waste decomposes, it releases greenhouse gases into the atmosphere. Like trapping of heat on earth that may affect abnormality of weather conditions like more storms or typhoons. Because of these reasons many

## **Problem:**

The Problem was that how will we collect data of Bio and non bio waste and how will we make it cost effective?

## **Hypothesis:**

We can make AID that helps in segregation as well as alert people whether they are using the right bin or not. There will be an assistant that will work in natural language so that anyone can interact. It will do waste segregation at the initial level. It will scan the waste and tell us whether it is bio or non-bio.



## **Aim:**

We aim to classify waste and finish wrong waste segregation and to do waste segregation at the initial level so that we can make a pollution-free environment.

## **Introduction:**

### **Parts to be used:**

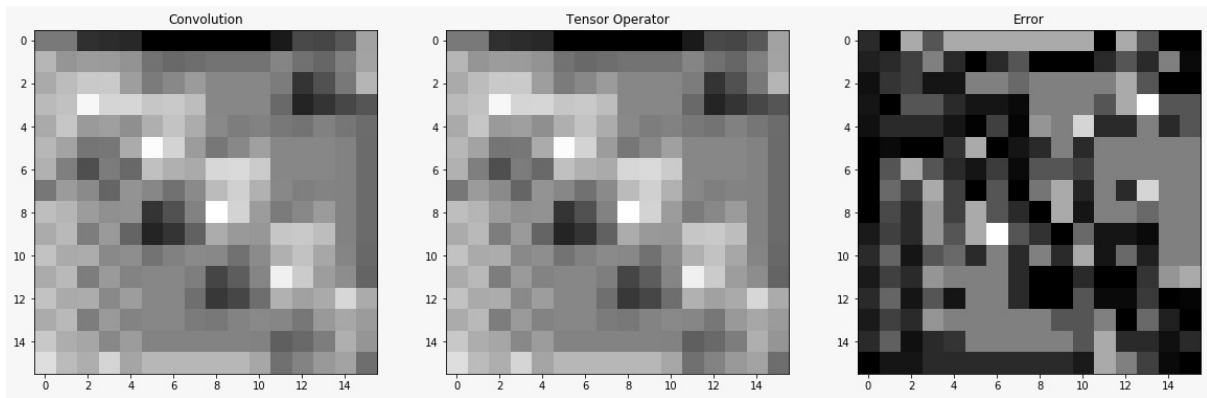
- Raspberry Pi - Raspberry Pi is a series of small single board
- Camera Module - To capture images of waste

### **Technology used in making the Software of this AID:**

- Teachable Machine - To train model
- Python - For Providing Some Machine learning based tools and learning.
- Openv - For detection of waste

### **How Different Things work:**

-Linear transformation- Convert 2d image to 1d image Like a straight line.



$$\hat{J}_{s_x, s_y}^{x, y, k} F_{x, y, k} = I_{s_x, s_y}$$

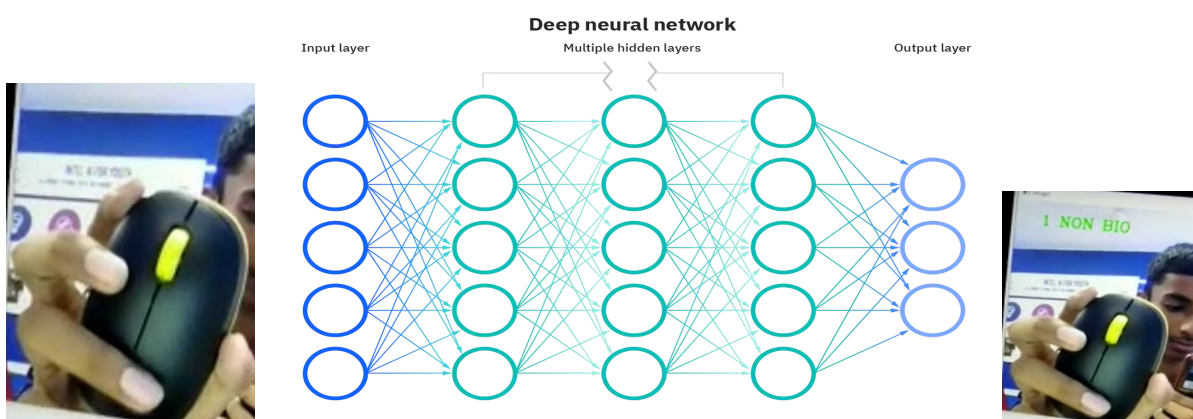
$$C_{s'_x, s'_y}^{s_x, s_y} I_{s_x, s_y}^{s'_x, s'_y} = C_{s'_x, s'_y}^{s_x, s_y} \hat{J}_{s_x, s_y}^{x, y, k} F_{x, y, k} = I_{s'_x, s'_y}^{s'_x, s'_y}$$

$$J_{x', y', k'}^{s'_x, s'_y} I_{s'_x, s'_y}^{s'_x, s'_y} = J_{x', y', k'}^{s'_x, s'_y} C_{s'_x, s'_y}^{s_x, s_y} \hat{J}_{s_x, s_y}^{x, y, k} F_{x, y, k} = F_{x', y', k'}^{s'_x, s'_y}$$

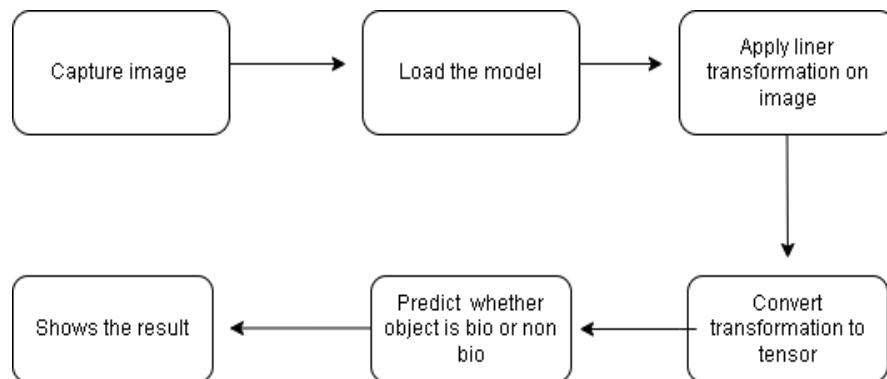
$$\left[ J_{x', y', k'}^{s'_x, s'_y} C_{s'_x, s'_y}^{s_x, s_y} \hat{J}_{s_x, s_y}^{x, y, k} \right] F_{x, y, k} = F_{x', y', k'}^{s'_x, s'_y}$$

$$\Xi_{x', y', k'}^{x, y, k} F_{x, y, k} = F_{x', y', k'}^{s'_x, s'_y}$$

Linear Transformation



## **FLOW OF THE APPLICATION**



In first step it is detecting object using opencv then it loading the trained model after this it convert 2d image to 1d image using linear transformation and then predict whether object is bio or non bio.