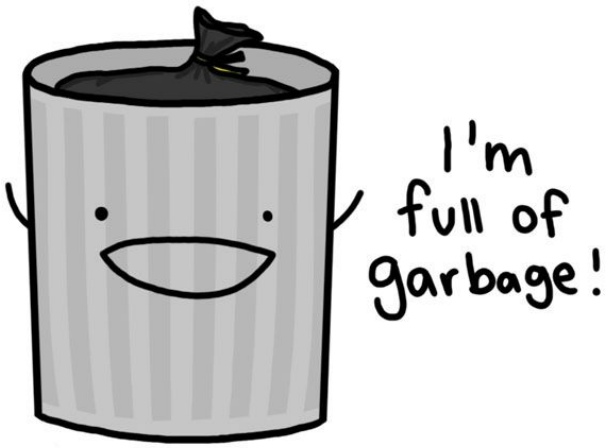
Introduction : What is Smart Bin?



- A smart bin is a bin that comes with the ability to indicate that it needs to be emptied whenever it reaches a certain threshold.
- Waste segregation is not only an environmentally pressing issue, it is an economic necessity as well. With the rapid generation of wastes we are fast running out of sites for landfills.

I. What is our Target Area?

As our great Prime Minister Narendra Modi has started the swachh Bharat Abhiyaan, that encourages youngsters like us to step forward, and take initiative for improving the cleanliness and hygiene of our country, we have chosen our BTP in this direction. Proper segregation of waste helps in timing its pickup & proper treatment (biogas plant for organic waste, reusing & recycling for inorganic waste).

II. What we have Done so far? (Methodology)

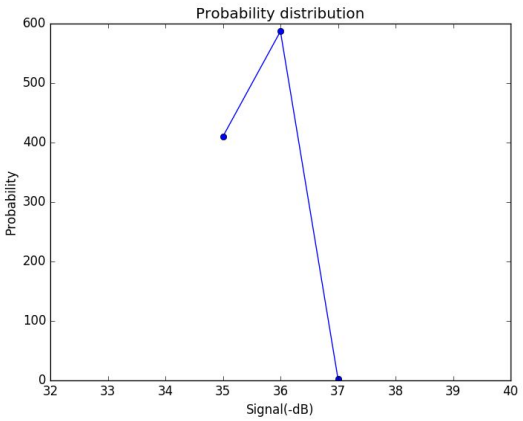
- Two Intel Edison were attached outside the bin opposite to each other as is shown in the picture.
- The function of one Intel Edison was that of a wifi hotspot while that of the other was to connect to that hotspot.
- The main motive of this setup was to analyze the effect on strength of signal due to various substances inside bin.
- We aim to collect as much data as possible, before applying machine learning techniques to make predictions for unknown substances.
- The height of bin filled can also be predicted using the variation in signal strength.


Edison

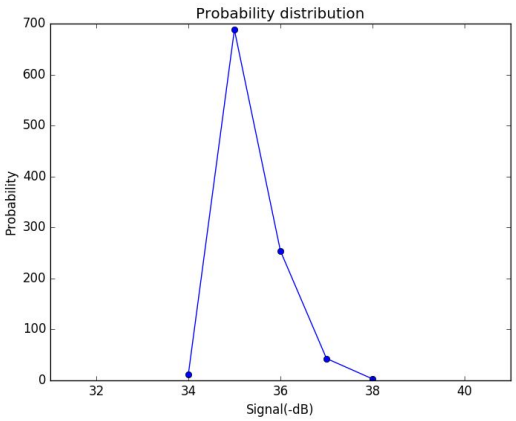

Edison
RAMSON
INDIA

III. What we have observed so far?

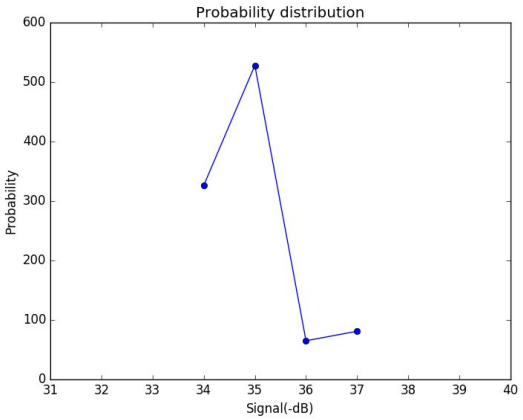
Signal strength distribution (of 1000 samples) for different heights of bin content



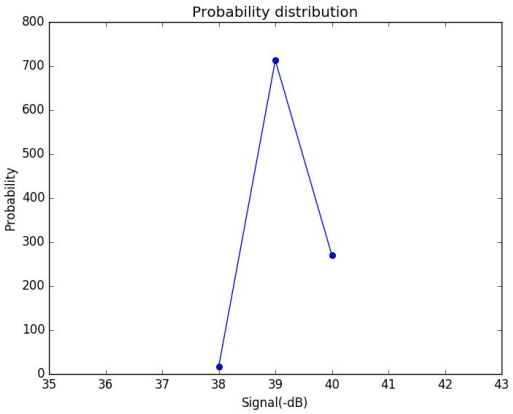
Height : 0% (Empty)



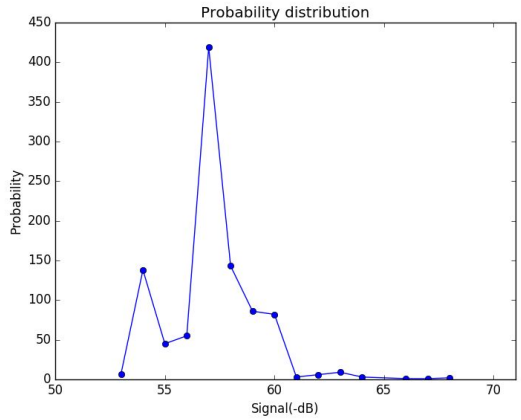
Height : 11%



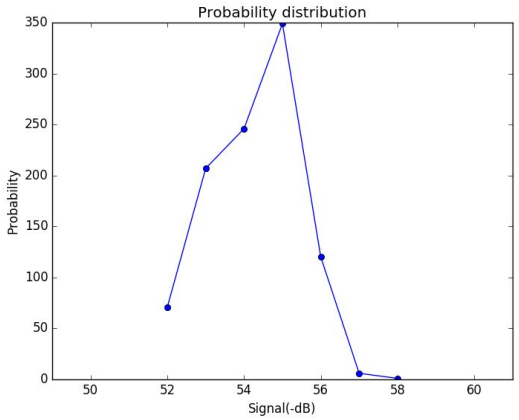
Height : 22%



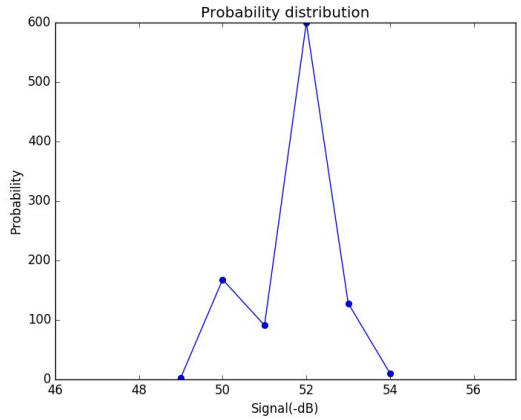
Height : 33%



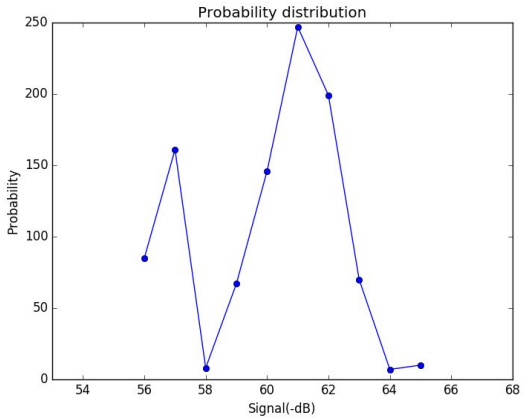
Height : 44%



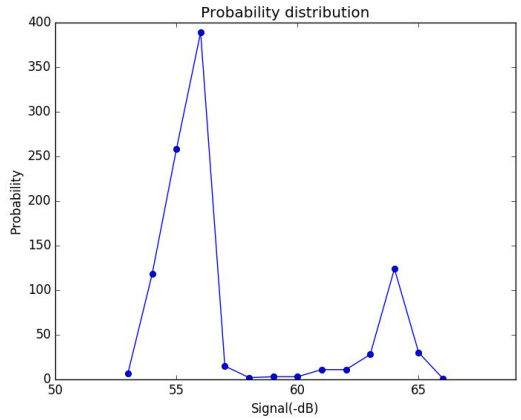
Height : 55%



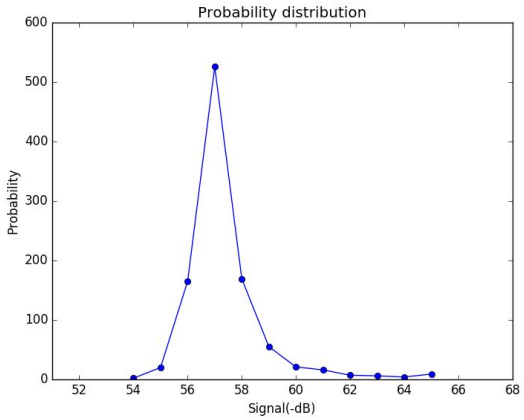
Height : 66%



Height : 77%

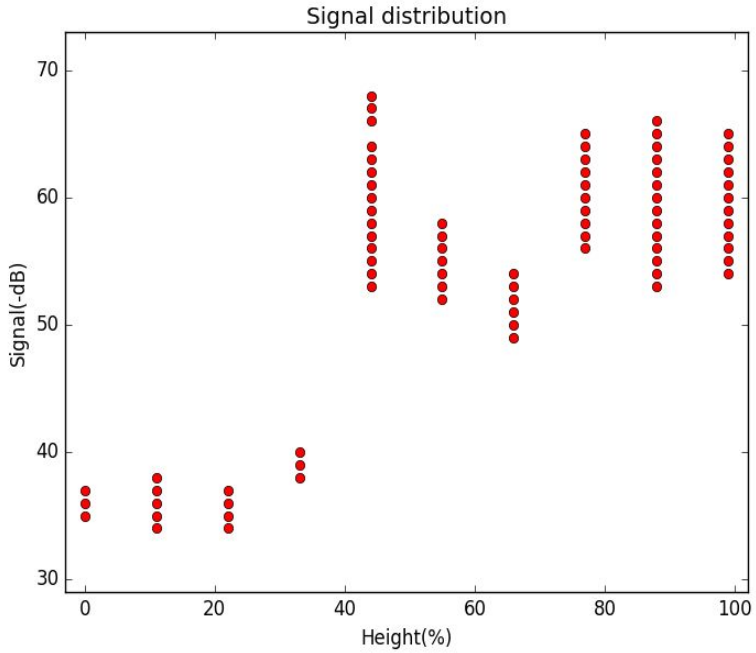


Height : 88%

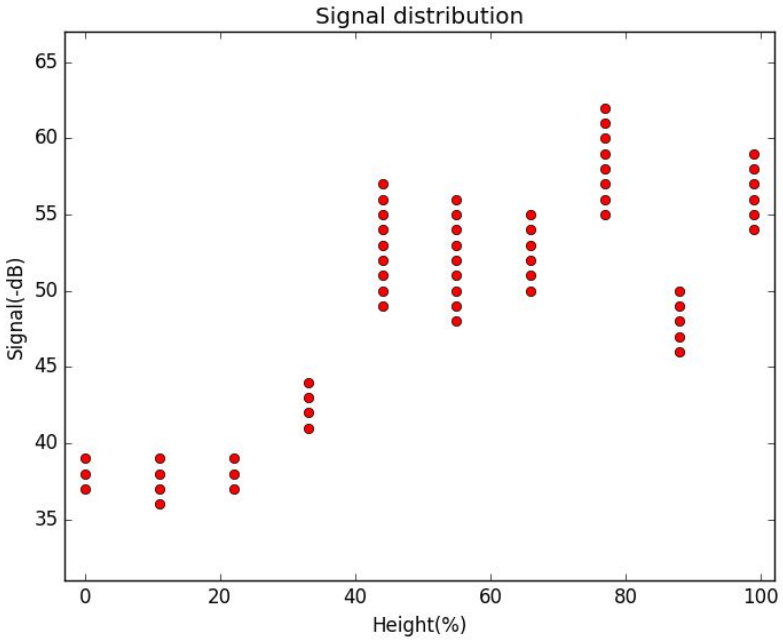


Height : 99%

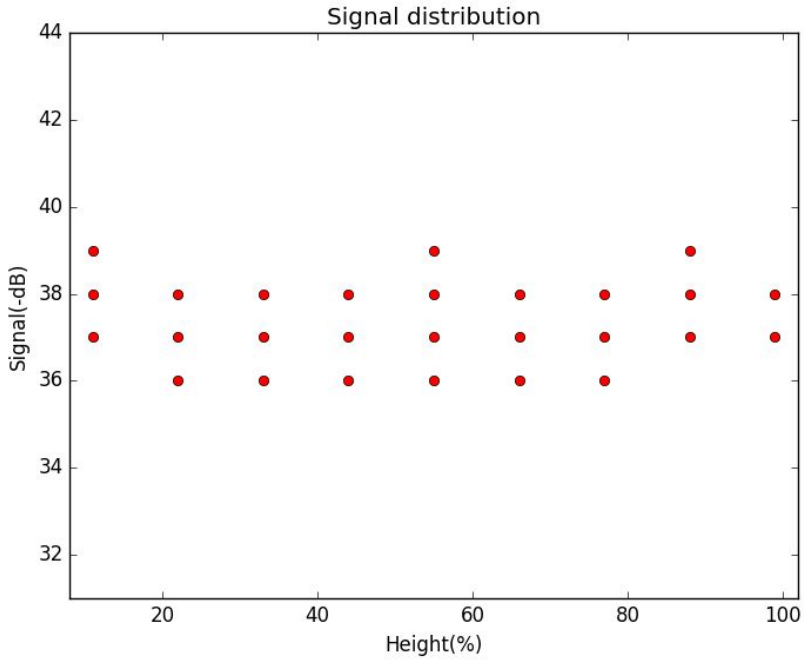
Height Vs Signal Strength for different materials



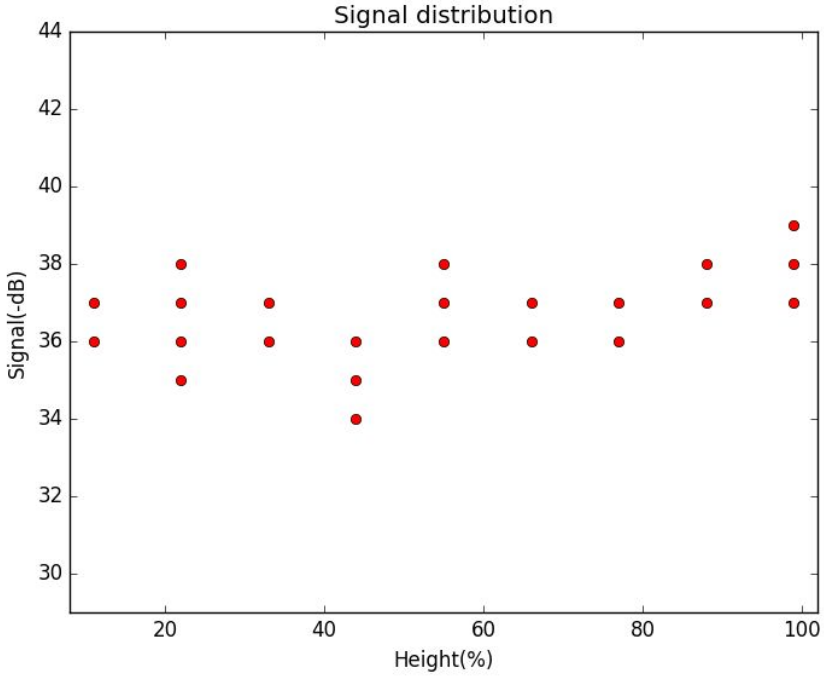
1.With water in **presence** of noise



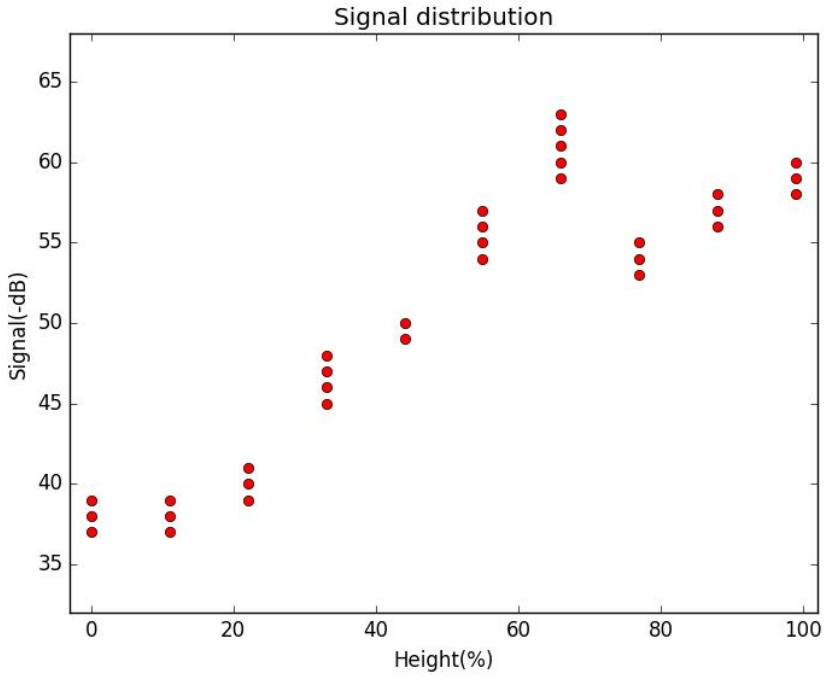
2. With water in **absence** of noise



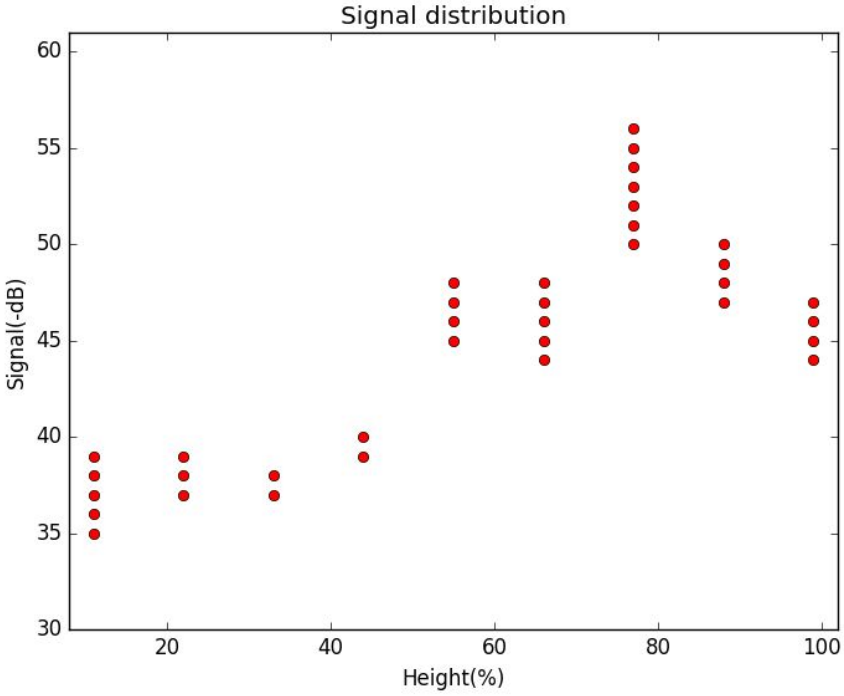
3. With paper



4. With Clothes



5. With Citrus limetta ( )



6. With random substances (electronic,metal etc.)

IV. What we have Learnt so far? (Research)

- We have learnt that a sensor that needs to be embedded in the bin is unhygienic & prone to damage.
- Wifi signal shows different variation with/without organic matter inside bin, therefore it can be used to determine the garbage content in the bin.
- The placement of wifi device (intel edison) effects the signal distribution.

V. What we have planned for near future?

To study the variations in signal by:

1. **Varying signal strength of wifi device(s)**
   Change the power of either of the devices or both and study its impact
2. **Varying the frequencies (channel 1-12)**
   Study the changes, if any, that happens when different communication frequencies are used