

# Garbage Segregator

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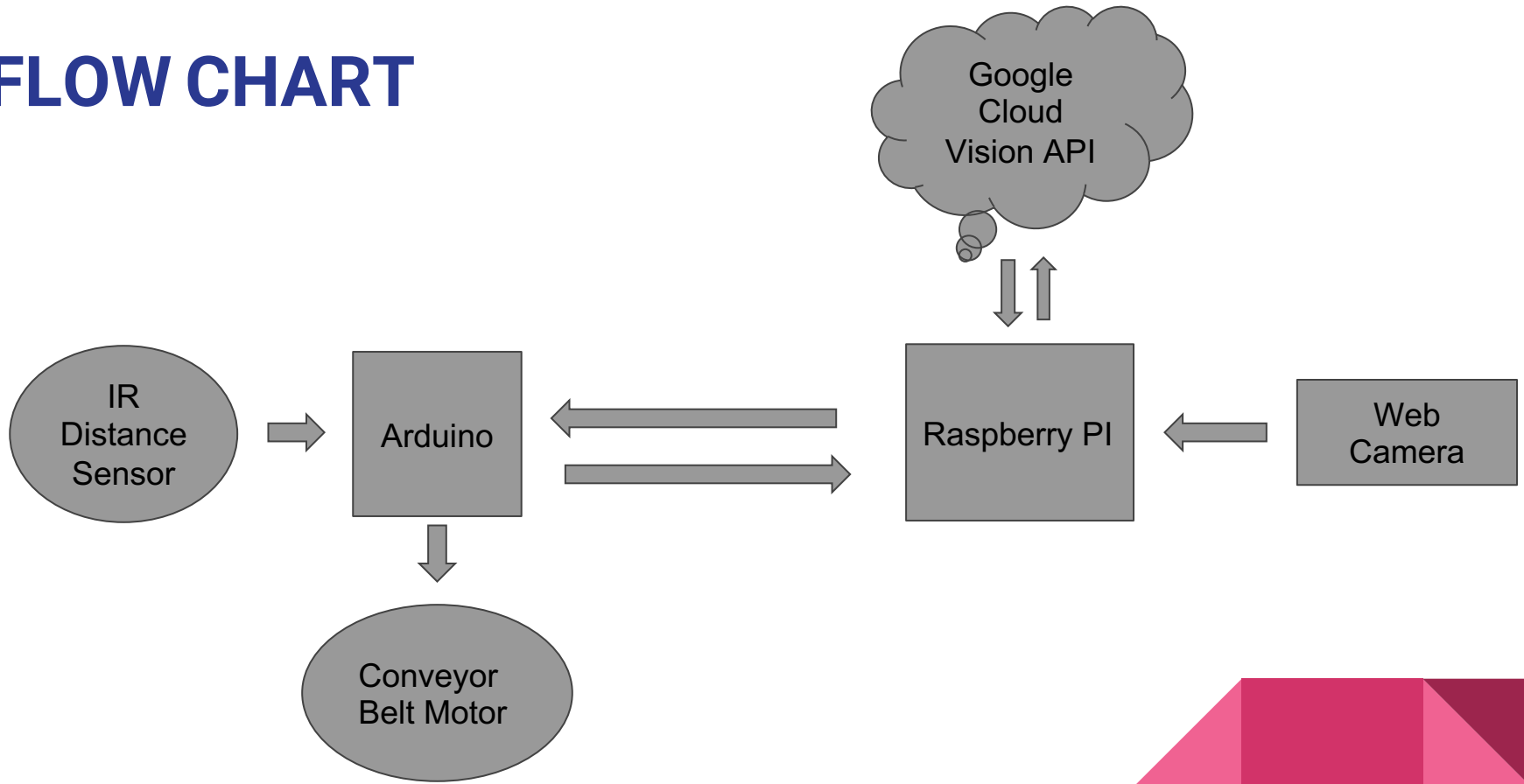
Kuldeep

# OBJECTIVES:

- To segregate garbage to reduce human efforts.
- Segregate garbage into different classes.
- Serial communication between Arduino UNO and Raspberry Pi.
- Learn OpenCV.
- Make an integrated system make it functional for advance learning.



# FLOW CHART



# WORKING

- Sensory feedback is given to arduino which communicates with raspberry Pi.
- Arduino UNO communicates with Raspberry Pi using serial communication.
- Raspberry pi makes use of **OpenCV** & Google Cloud API to detect object in front of it.
- Then the captured image is then uploaded to **Google Cloud Vision API** for object recognition.
- After recognition we get back results from the API and then we manipulate the data to carry out segregation function.

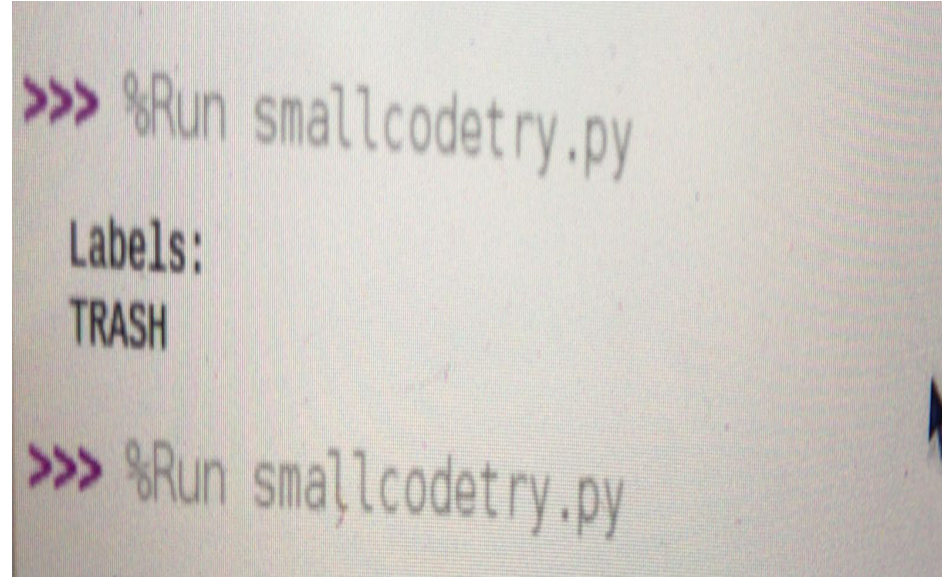


# CHALLENGES:

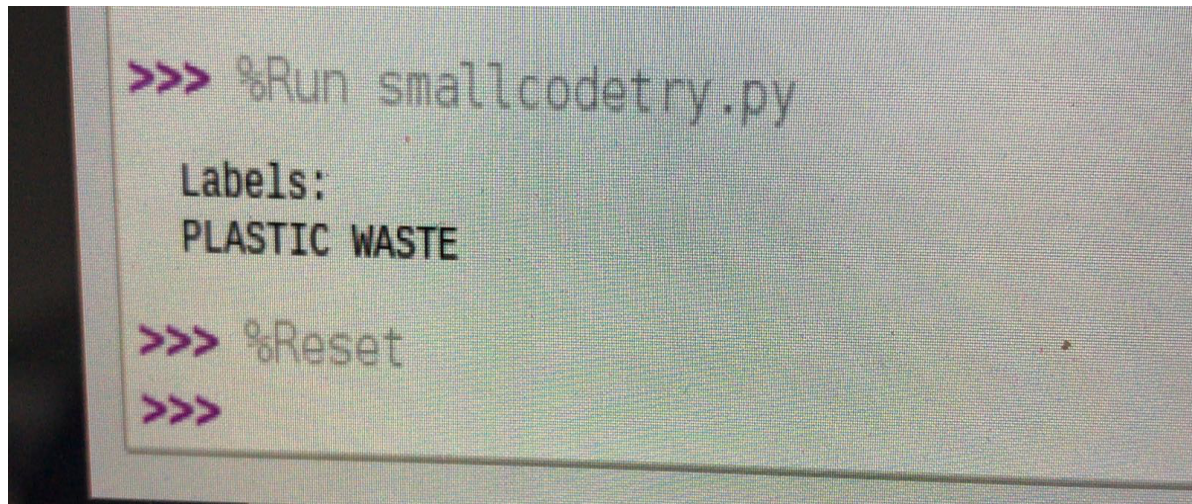
- Use of OpenCV for colour detection.
- Simultaneous processing of various inputs and outputs.
- Integrating google cloud vision API to raspberry Pi.
- Communication between Arduino and Raspberry Pi.
- Hardware upgradation for highest accuracy.
- Integrating system as a whole.



# TRASH



# PLASTIC WASTE





# BIODEGRADABLE WASTE



```
>>> %Run smallcodettry.py  
  
Labels:  
BIO-DEGRADABLE WASTE  
BIO-DEGRADABLE WASTE  
  
>>> %Run smallcodettry.py
```



# LEARNING:

- Detecting trash using OpenCV.
- Able to learn how google cloud vision API works and use it with Raspberry Pi for trash classification.
- Successfully completed serial communication between Arduino and Raspberry Pi.
- Upgraded hardware according to the requirement for task completion.
- Debugging software for eliminating errors.



# FUTURE WORK

- Major part which should be focused on is very precise recognition of trash and multiple objects simultaneously.
- High level of intelligence has to be implemented to make it for industrial or household purpose.
- Upgradation of hardware mechanism to industrial standards.



# VIDEO DEMONSTRATION:





**Thank You!!**

**Questions?**