Non-organic recyclable house waste collection and separation system.

Capstone2.0 **CLUSTER#1 Team# 14** **Coaches: Dr. Muhammed Emzir**

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Problem Statement

The increasing of environmental effects of non-organic recyclable house waste and ineffective waste management practices necessitate innovative solutions to minimize environmental impact and promote sustainable waste management.

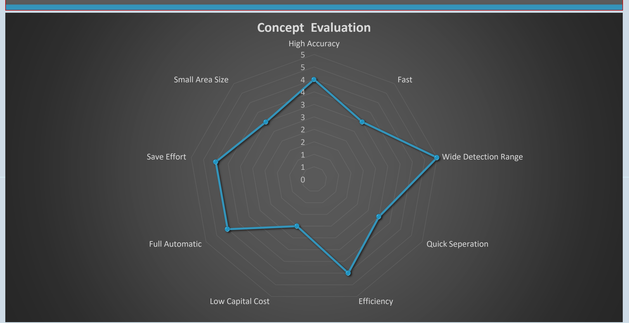
Specifications

- Area coverage of 180*80*100 cm.
- Garbage bin size of 8L.
- Work 6 hours without charging.
- Utilizing Solar energy as the main source of power of 200 W.
- AI Classification Accuracy of 90%.

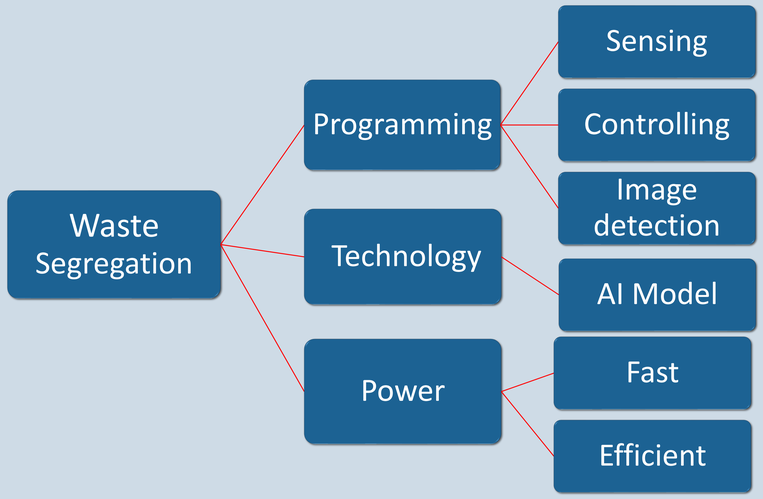
Constraints

1. **Weather Conditions**: Weather should be ideal, such as sunny days
2. **Space Limitations:** The space must be considered to integrate the system
3. **Budgetary Constraints: T**he project should have allocated budget.
4. **Cultural and Societal:** Societies should be aware of the benefits

Project Evaluation

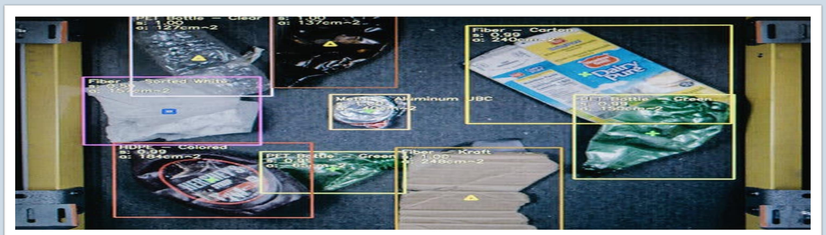


Function of Product



Sensors & Motor selection

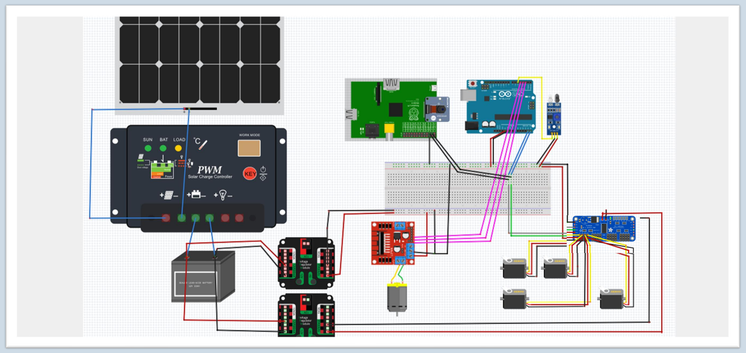
Web Cam	• Visual camera • Visual Detection
MG996R	• Servo Motor
Ultrasonic Sensor	• Distance Senor
DC Motor	• Gare Motor



- The Image detection technique was done by AI Fomo model.
- The programming was done by Python language.

High torque motor volt: 12-volt DC Torque : 12 Kg.cm

Final Prototype Design



Raspberry Pi is the controller

Rechargeable lead-acid batteries 200 Watt

Most of the design is made of wood and the rest is made of plastic, 3D printing is also used to create the arm of the servo motor.

Validation & conclusion

1. The size of the whole system is 180*80*100 cm.
2. Utilizing Solar energy as the main source of power of 200 W.
3. AI Classification Accuracy of 90%.

In summary, the system operates in a fully automatic manner, utilizing a Raspberry Pi as its control unit. Power is provided by a battery that is efficiently charged through the use of a solar panel. This integration eliminates the need for any human intervention, making the system highly autonomous and efficient in its waste management capabilities.