DRY-WET ROBO SORTER

An autonomous RC rover designed to efficiently sort wet and dry waste.

Presentation by TEAM 6

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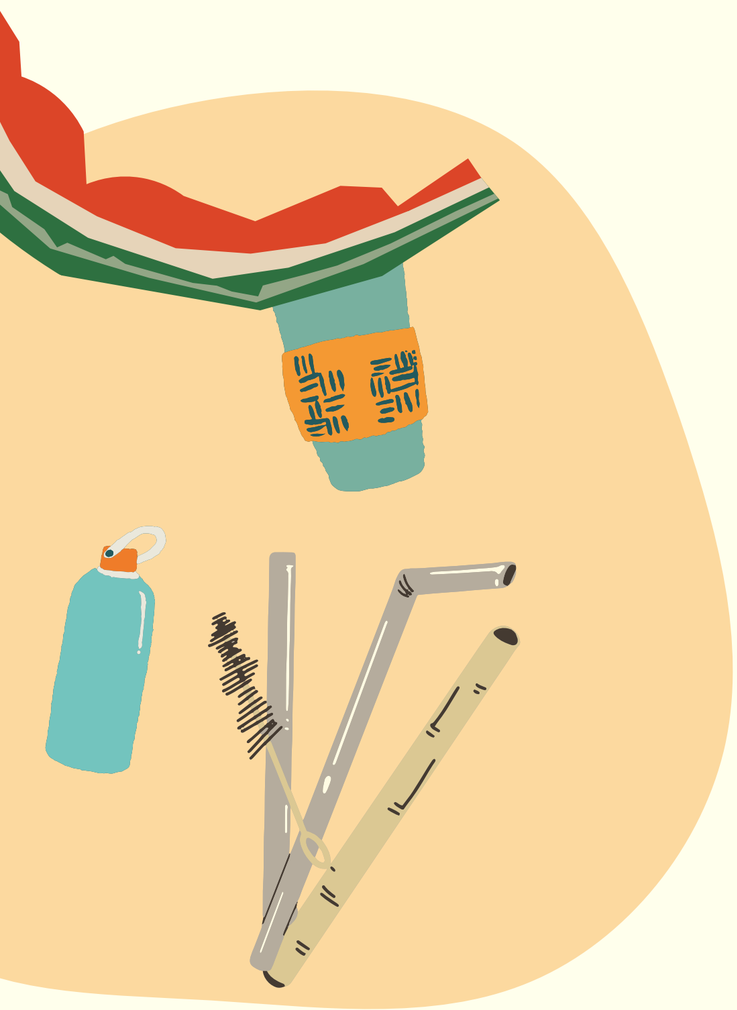
BACKGROUND

Effective waste management has become increasingly crucial on university campuses, where large volumes of waste are generated daily. Traditional methods of manual waste sorting are labor-intensive, time-consuming, and often result in improper segregation, reducing the effectiveness of recycling programs. To address these issues, our project introduces an RC rover with an automated waste separation system, designed specifically for university environments. This prototype aims to promote sustainable practices by integrating technology into campus waste management. By efficiently identifying and sorting wet and dry waste, it contributes to a cleaner campus while educating students on environmental responsibility and innovation.

Problems

1. **Inefficient Sorting: Manual segregation leads to mixed waste and poor recycling.**
2. **High Labor Costs: Requires significant manpower for sorting and collection.**
3. **Contamination: Mixing of wet and dry waste reduces recyclability.**
4. **Time-Intensive: Manual processes are slow, causing bin overflow.**
5. **Low Awareness: Lack of automation limits knowledge of proper waste management.**
6. **Environmental Impact: Ineffective waste handling increases pollution and hinders sustainability goals.**

PROPOSED SOLUTION



Automated Waste Segregation

Design and implement a system that uses sensors to automatically distinguish between wet and dry waste, ensuring precise segregation at the source. This minimizes contamination, making recycling more efficient and reducing landfill contributions.

Remote Mobility for Efficient Collection

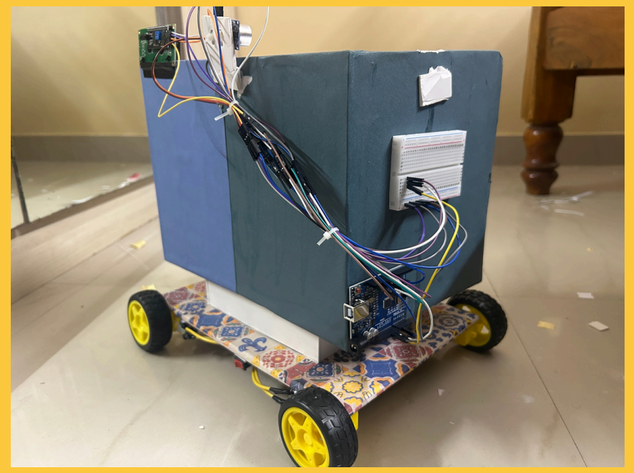
Equip the system with a remote-controlled rover to reach various campus areas, including hard-to-access and high-traffic zones. This mobility enhances the flexibility of waste collection, ensuring that waste segregation is consistent across all campus locations.

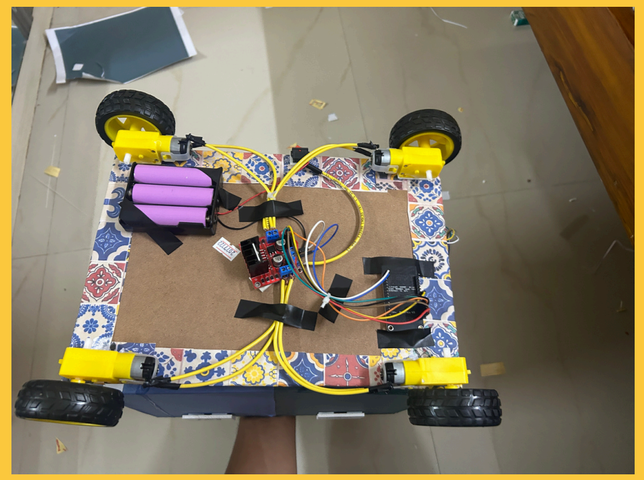
COMPONENTS USED

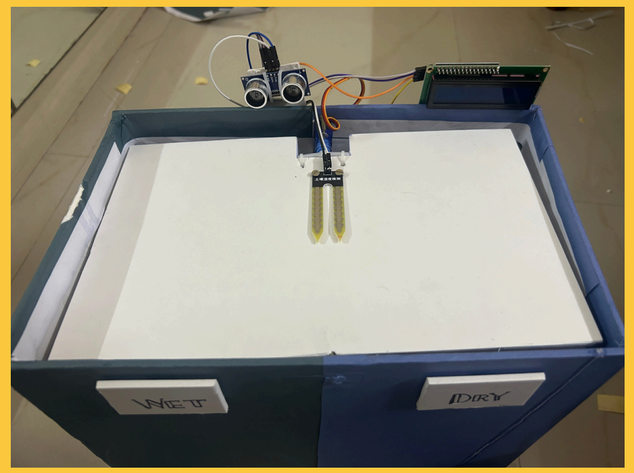
- Arduino uno smd
- 16x2 LCD with i2c interface
- Servo 9g motor
- soil moisture sensor
- ultrasonic sensor
- nut and bolt
- Jumper wire
- Bread Board
- 12v Batter
- nodemcu
- esp8266 module
- L298N motor driver
- gear motor with wheels
- switch

PROTOTYPE

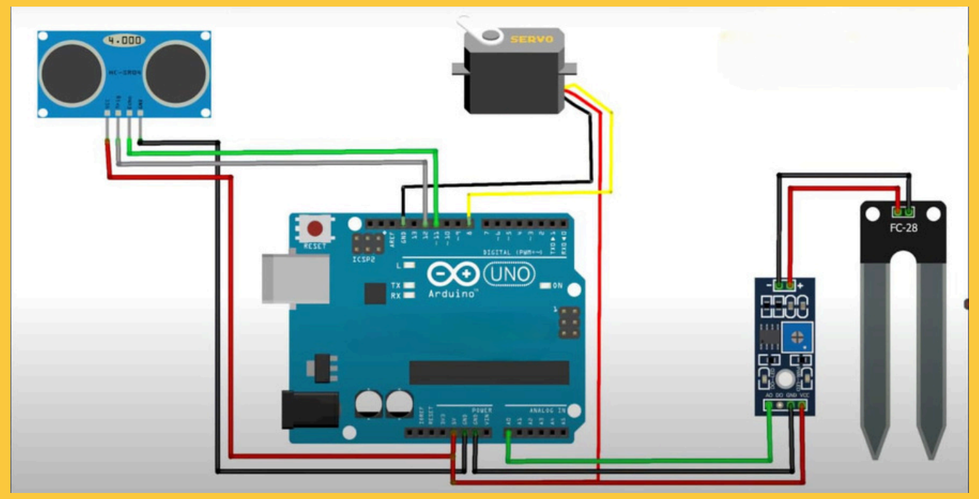
Why is



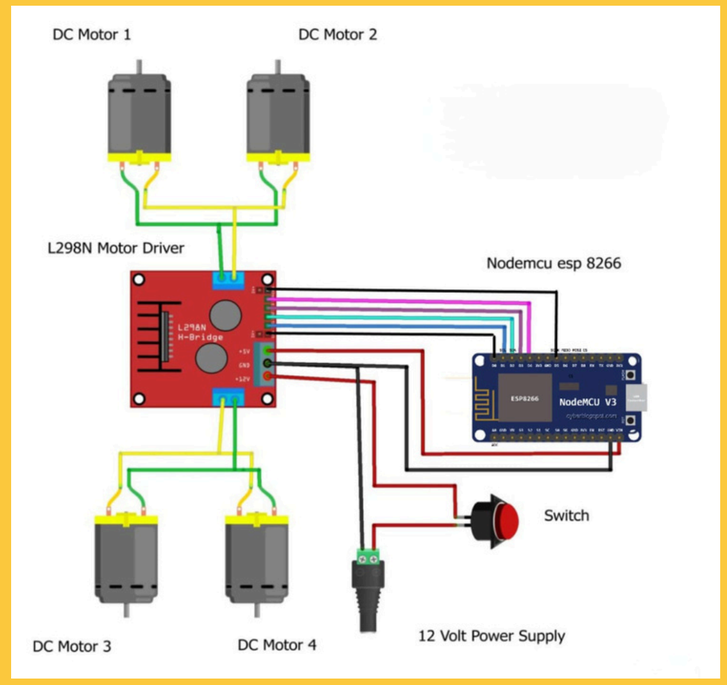




CIRCUIT DIAGRAM



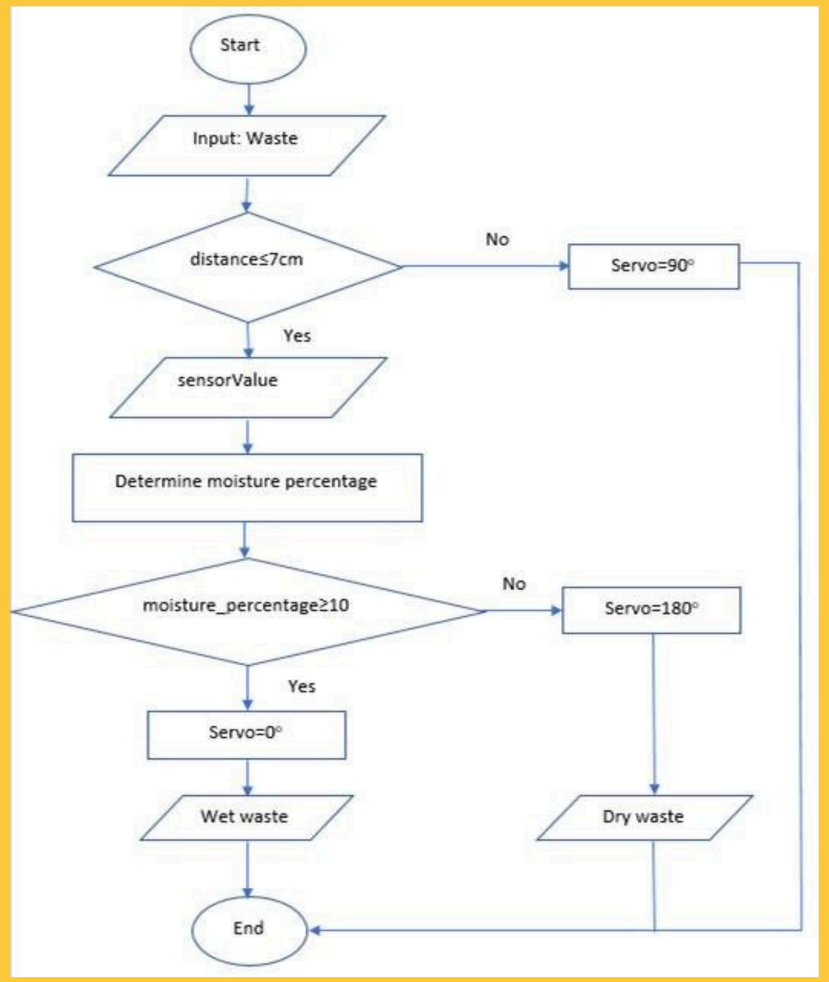
WET-DRY SEPARATOR



RC ROVER

FLOWCHART

Why is



SWOT ANALYSIS

Strengths

1. Efficiency - Improves waste sorting speed and accuracy.
2. Real-Time Data - Provides immediate insights into waste types and volumes.
3. Integration - Can connect with other smart systems and IoT infrastructure.
4. Cost Savings - Reduces manual labor and associated costs over time.
5. Data Analytics - Enables detailed analysis for optimizing waste management.

Weaknesses

1. Initial Cost - High upfront cost for equipment and setup.
2. Maintenance - Regular maintenance needed for sensors and mechanical parts.
3. Connectivity Issues - Dependent on stable network connections for data and remote monitoring.

Opportunities

1. Market Demand - Growing need for efficient waste management solutions.
2. Integration with Other Systems - Can be integrated with smart city infrastructure and other waste management technologies.
3. Customization - Opportunity to customize the system for specific waste types or regional requirements.

Threats

1. MarkeCompetition - Competing waste management technologies could impact adoption.
2. Technological Advancements - Rapid changes in technology may require frequent updates.
3. Regulatory Challenges - Changes in regulations may impact system requirements or operational practices.

FUTURE APPLICATION

- Expanded Campus Use: Integration across entire campuses, including dorms, libraries, and recreational areas.
- Smart City Integration: Adaptation for use in smart city waste management systems.
- Enhanced AI Sorting: Improved machine learning for detecting more waste types like recyclables and hazardous materials.
- Real-Time Monitoring: Integration with IoT for real-time data tracking and optimized waste collection schedules.
- Commercial Spaces: Use in malls, airports, and offices to streamline waste sorting and recycling.
- Educational Tool: Deployment in schools to promote environmental education and sustainable practices.

THANK YOU!