# LIMIT BREAKERS

WHERE LIMITS END,POSSIBILITIES BEGIN



## TECHNICAL OVERVIEW

1.Chasis dimensions : 29*30*27
2.Motor controller : Arduini uno
3.Microprocessor Microprocessor: Rasberry Pi 4
4. Li-ion 18650 3.7V battery power supply 5.RP-LiDAR
6.. TT Motor offloading mechansim

## VISUALIZATION



With RViz, Mapping and navigation data are transformed into 3D visuals, allowing us to see paths, obstacles, and movement in real time

## ACHIEVEMENTS

- **Mapping** – Built a system to create and update environmental maps for navigation.
- **Terrain Navigatio**n – Robot moves reliably across uneven on complex surfaces.
- **Image Detection** – Integrated vision system to identify and classify objects.
- **Object Handling** – Automated loading and offloading of items with precision.

## COMPONENTS



Provides 360° laser scanning for mapping and obstacle detection.



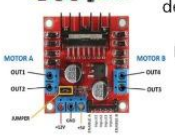
Acts as the brain, running navigation, vision, and decision-making software.



Enable movement and mobility of the robot.



Handles low-level control of sensors and actuators.



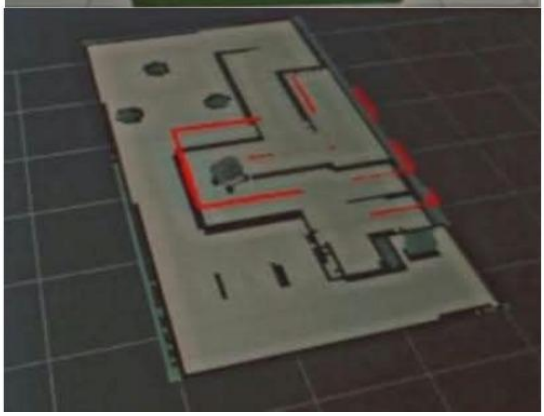

Regulates power flow to motors for speed and direction control.



Provide stability and movement, enabling the robot to traverse different terrains.

## SIMULATION ENVIROMENT





## PROBLEM STATEMENT AND PROPOSED SOLUTION

The global waste crisis (driven by massive volumes of municipal solid waste and fast-growing electronic waste) overwhelms traditional manual sorting and recycling capacity, with global e-waste climbing past 62 million tonnes annually while a fraction is recycled.

Robotics, paired with artificial intelligence (AI) and computer vision, provides scalable, high-speed solutions across waste management streams. This year's challenge to beat is built to develop this solution. The robot is an autonomous mobile device that navigates a game field identifies and collects waste items and offloads them at a drop zone.

Scan to watch the robot in action 🚀