The Obsidian Order

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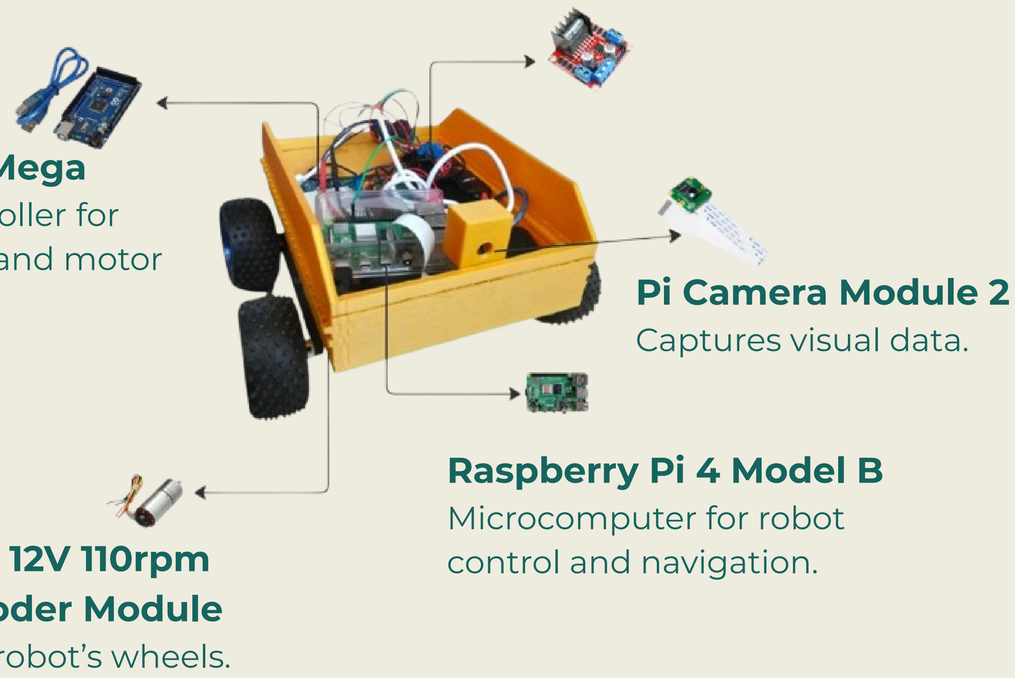
Technical Overview

- Chassis Dimensions: 29 * 24 * 23 cm
- Motor Control: Arduino PID
- RPLidar A1 2D Scanner
- Li -Po 3S 2200 mAH Power Supply
- Processor: Raspberry Pi 4
- Communication: UART



L298 Dual H-Bridge Motor Driver
Hardware for motor control.

Arduino Mega
Microcontroller for hardware and motor control.

Pi Camera Module 2
Captures visual data.

Raspberry Pi 4 Model B
Microcomputer for robot control and navigation.

DC Motor 12V 110rpm with Encoder Module
Drives the robot's wheels.

Achievements

Design and Build

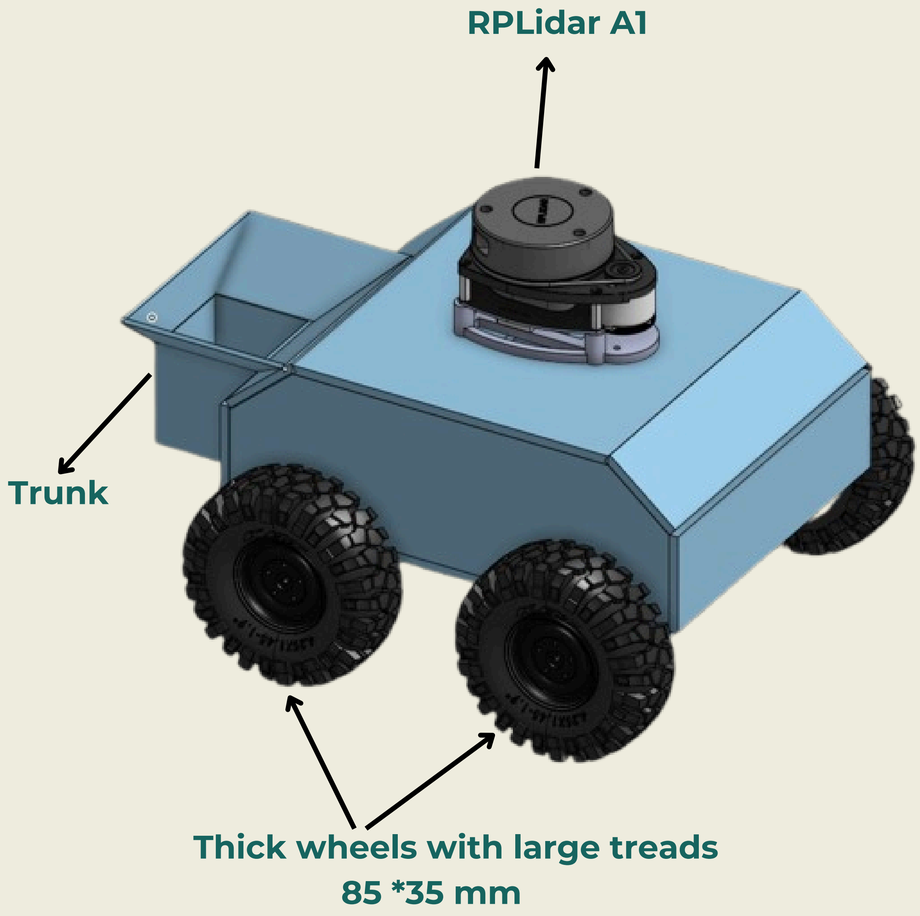
- A stable chassis with a narrow track width and treaded wheels for improved traction.
- A protective casing conceals the cabling, resulting in a cleaner and more durable build.

Mapping and Navigation

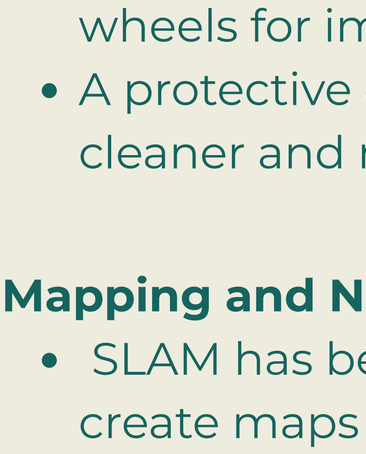
- SLAM has been implemented, enabling the robot to create maps of its surroundings.
- The robot localizes itself for accurate navigation in real time.

Perception and Detection

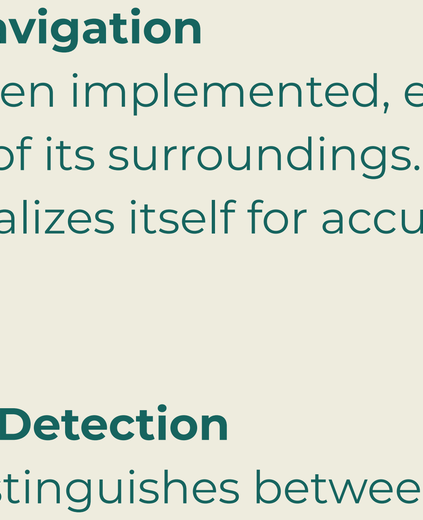
- The robot distinguishes between healthy and unhealthy plants, enabling it to support automated crop monitoring.



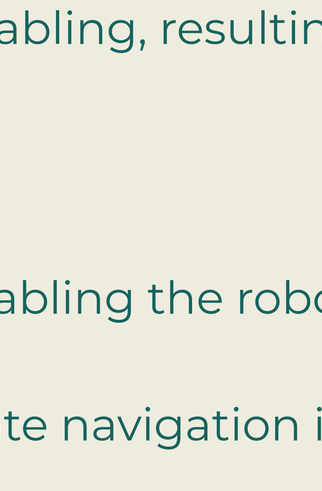
SLAM and NAV2



Our robot moving in real time.

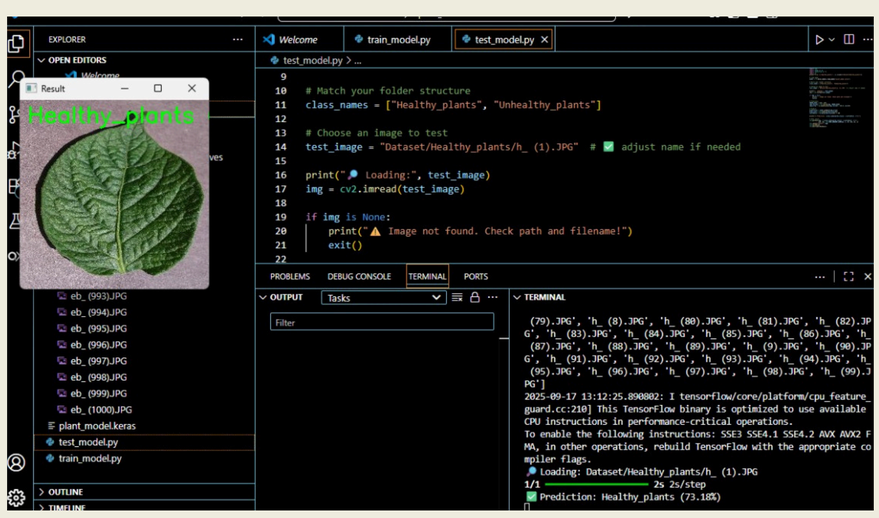


Map generated during SLAM.



The generated global costmap.

Disease Detection



Training the model to detect healthy, early blight and late blight using TensorFlow.