UNIVERSITY OF MARYLAND

ACME CORPORATION

Autonomous Lawn Mower

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Overview

- Design and deliver the source code and simulation demo of ACME Robotics' new LTS product, an autonomous lawn mower.
- Given a known map, the lawn mower will be able autonomously traverse a set of waypoints and mow the lawn.
- The robot always returns to the home position after it is done mowing the lawn.

Design Practices

- Unit tests for each module will be performed using Google Tests and ROS tests
- Developer-level documentation will be provided
- Pair Programming methods will be followed.
- Robust unit tests to cover the entire code base.
- Agile software development will be practiced.

Technical Design

- ROS and C++ for developing the entire project, Gazebo for the simulation of the module and RVIZ for visualization of the data.
- Localization of the robot will be performed using AMCL and position goals will be provided to movebase.
- Movebase ultimately publishes the requisite velocities to the cmd_vel topic which drives the robot to its goal position

Key Milestones & Deliverables

- A high-quality module for autonomous waypoint navigation and simulation of lawn mower robot.
- Complete documentation including class diagrams and activity diagrams.
- An up-to-date Github repository.
- Timeline:
  - Final design proposal: 11/29/2021
  - Class and Method implementations: 12/06/2021
  - Unit testing: 12/11/2021
  - Final release of the module: 10/13/2021