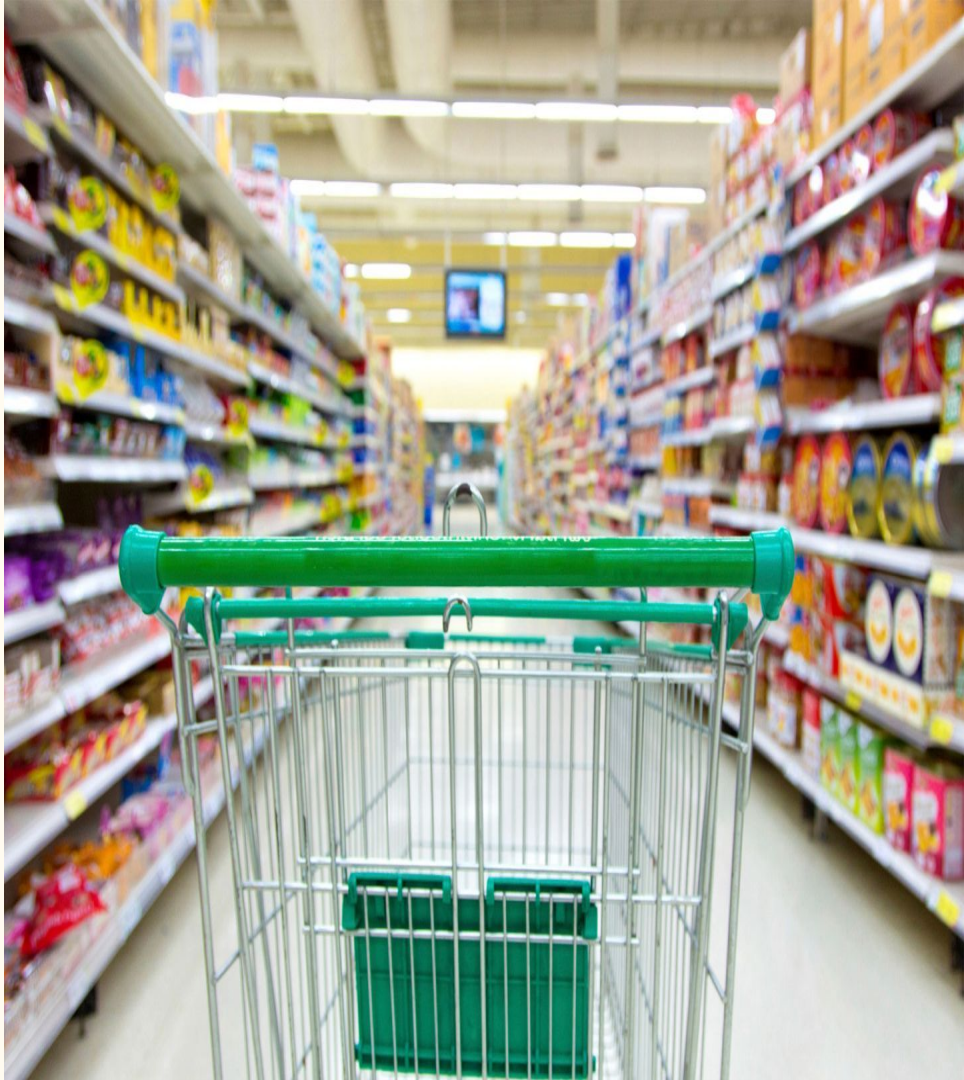
Robotic Grocery Assistant

Nikhil Manda, Shiva Dhanush Konuru, Harshith Nanda



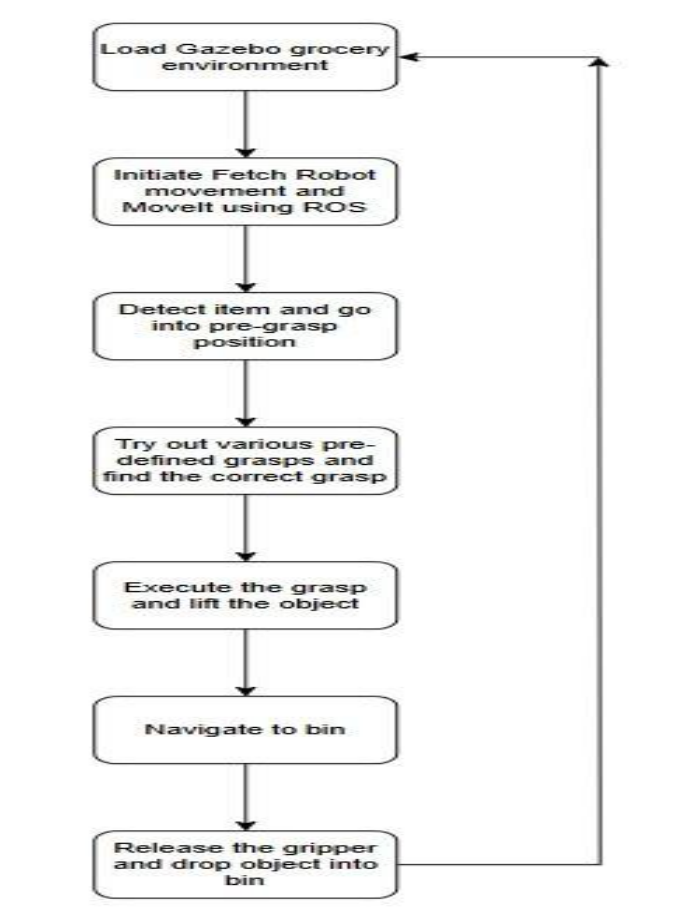
Background and Motivation

- Traditional grocery order fulfillment is slow, labor-intensive, and error-prone, limiting efficiency in meeting fast delivery demands.
- Robots offer a solution by automating item retrieval, boosting productivity, and improving customer satisfaction.
- Retail environments pose unique challenges for robots, including navigating shelf layouts and handling diverse items.
- This project designs a robotic system to autonomously retrieve and consolidate grocery items, streamlining operations and reducing fulfillment time.

Tools and Technologies

- Simulation: Gazebo provides realistic 3D modeling, with ROS as the core framework and MoveIt! for motion planning and grasping.
- A modified AWS Bookstore World replicates a grocery store with shelves, bins, and aisles for testing.
- The setup enables straight-line navigation and safe, stable item retrieval and placement using MoveIt!

Updated Approach Workflow



Updated Demo

Next Steps (As of 12/4)

- Straight-line navigation using cmd_vel commands for consistent, repeatable movement, with efforts to address any errors or deviations observed during testing.
- Performance would be evaluated through structured trials to measure success rates and efficiency, while failure analysis will guide further optimizations.