AA 274A Final Project

Group 30
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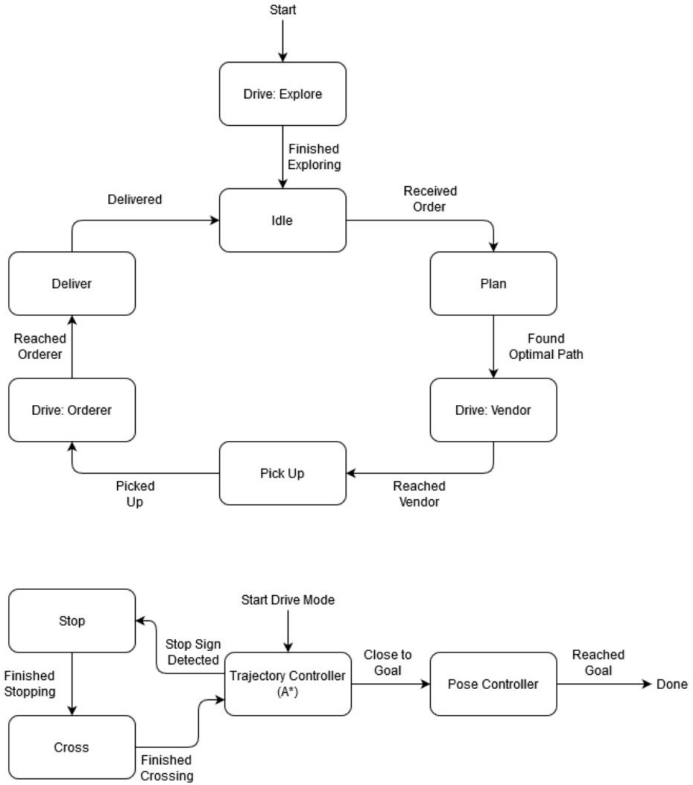
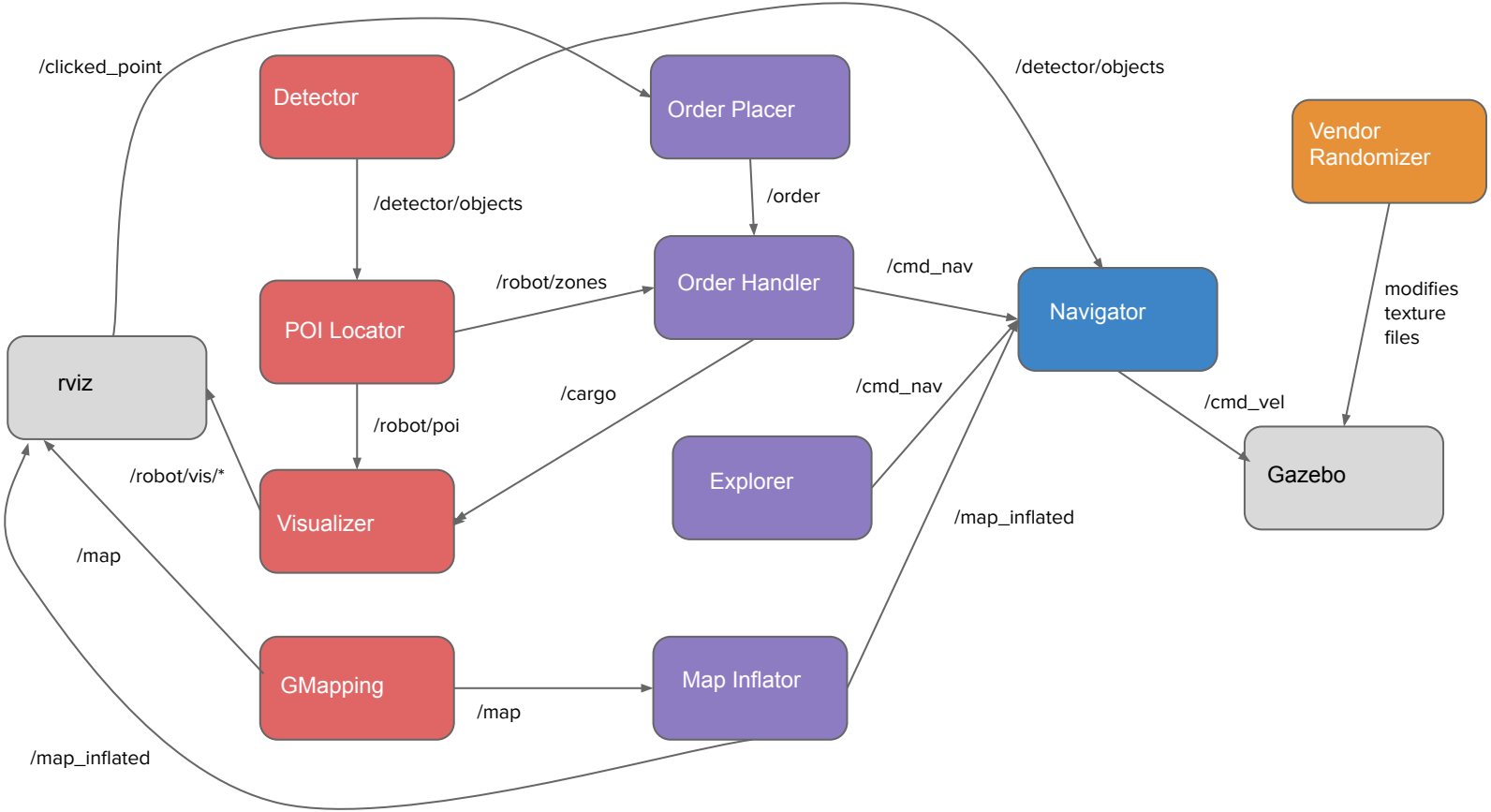
Finite State Machine



ROS Block Diagram

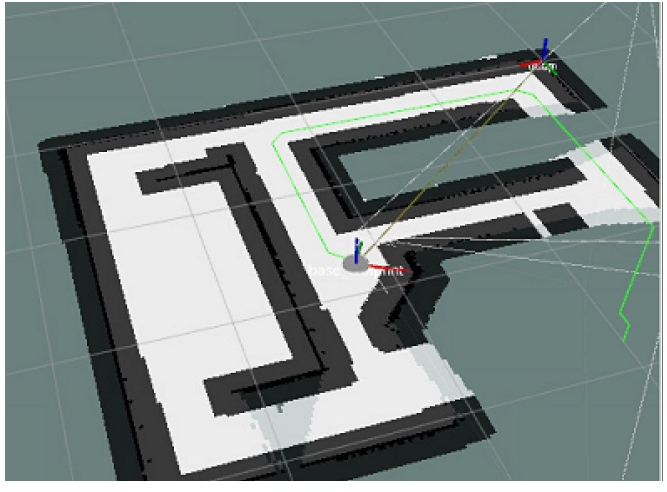


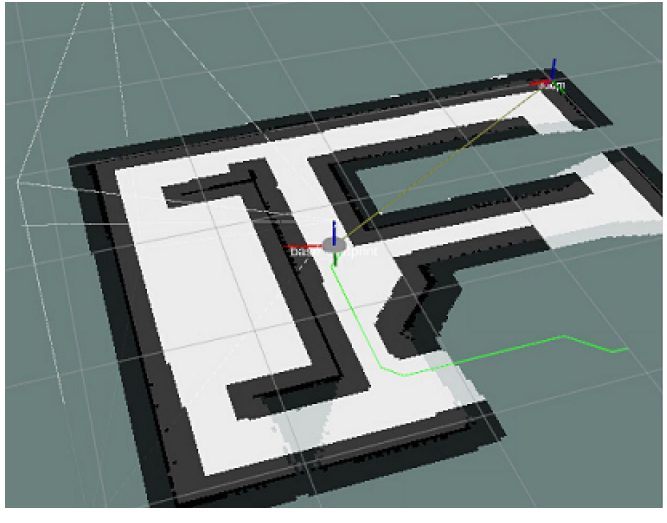
Extensions

- Autonomous Exploration
- Stop signs
- Command Center
- Shortest Path

Exploration

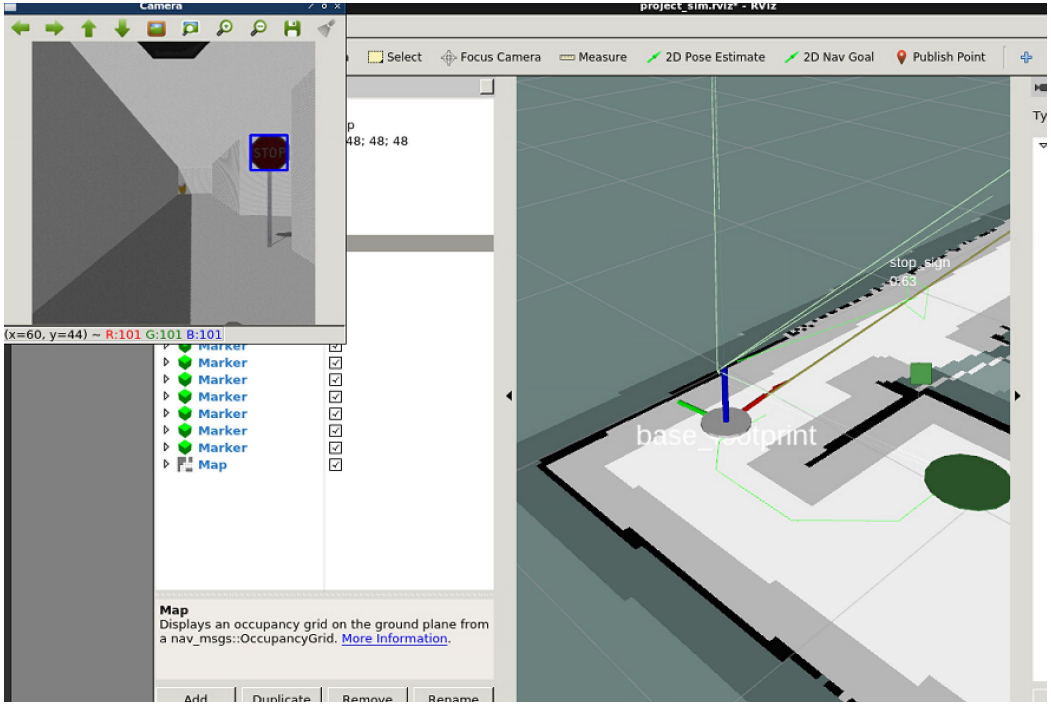
- Setup: waypoints are specified manually using RVIZ
- Waypoints are saved in a file for later recall
- On startup, the explore_control node runs through various
- Robot visits each point in the queue until exploration is complete





Stop Signs

- Robot uses CNN to detect objects in the environment
- If the object detected is a stop sign, the FSM in the Navigator script switches into a “stop” state
- Robot stops 2 meters away from every stop sign for 3 seconds before continuing

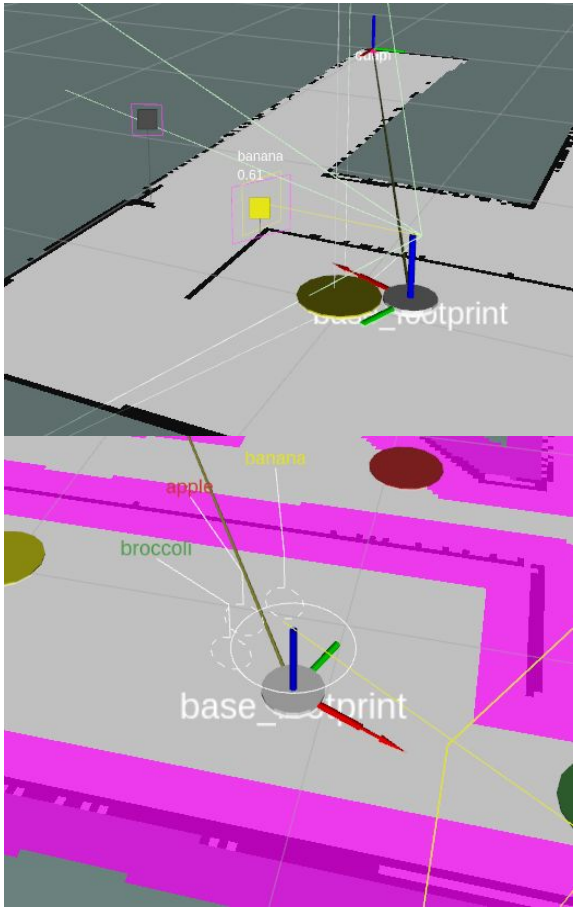


Command Center

Visualize:

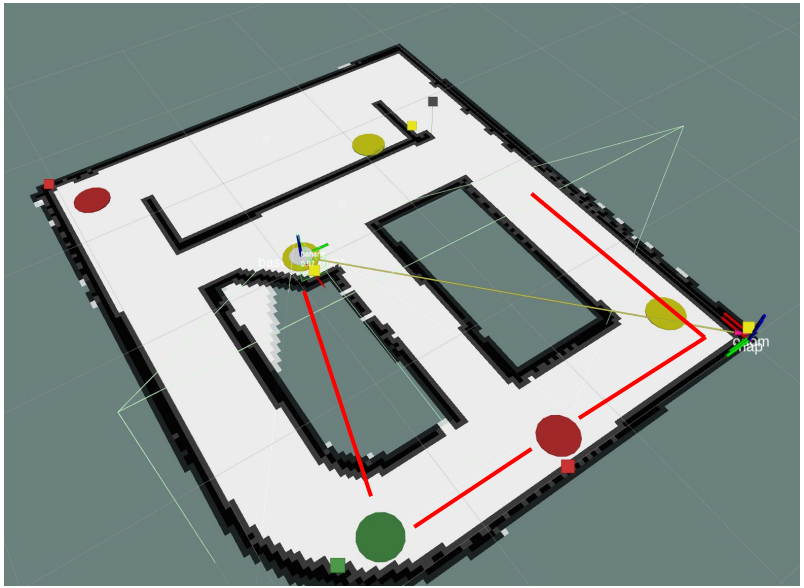
- Inflated walls.
- Vendor signs and determined pickup zones.
- Nav state and goal.
- Camera frustum, detections.

Robot is aware of detected object bounds, and its own inventory.



Shortest Path

- Three types of foods with two unique vendors each (randomized at launch)
- When an order is received, the robot must choose which vendors to visit and in which order
- Solve Traveling Salesman problem
- Robot attempts to maximize food “freshness” at delivery, i.e. shortest total distance/time from first pickup to delivery



Route for Order = [Apple, Broccoli]

Thank You