

Tier 4 Final Project

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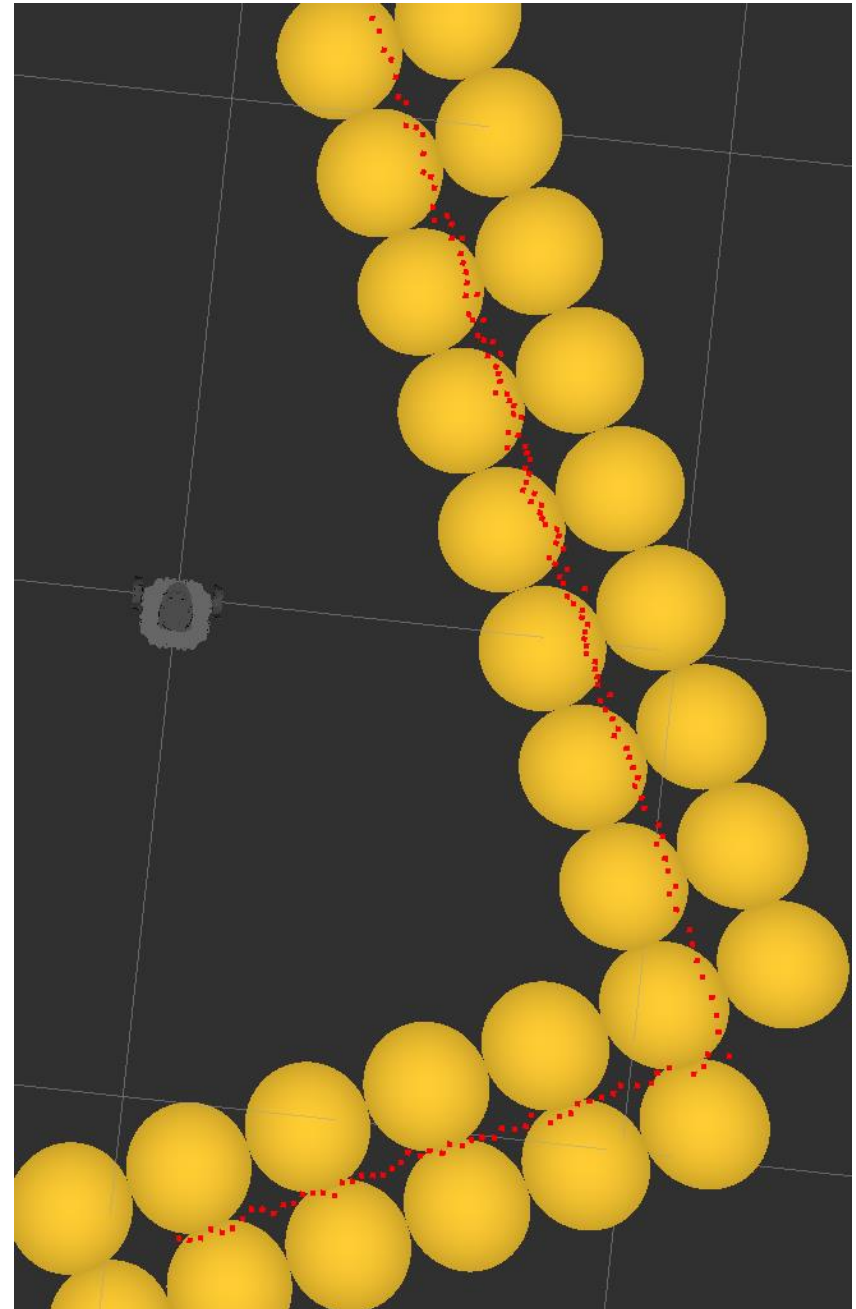
- Navigation algorithm
- Obstacle detection
- Path finding
- Goal selection

Navigation algorithm

1. Update grid
2. Update goals
3. Select goal
4. Find path
5. Move along path

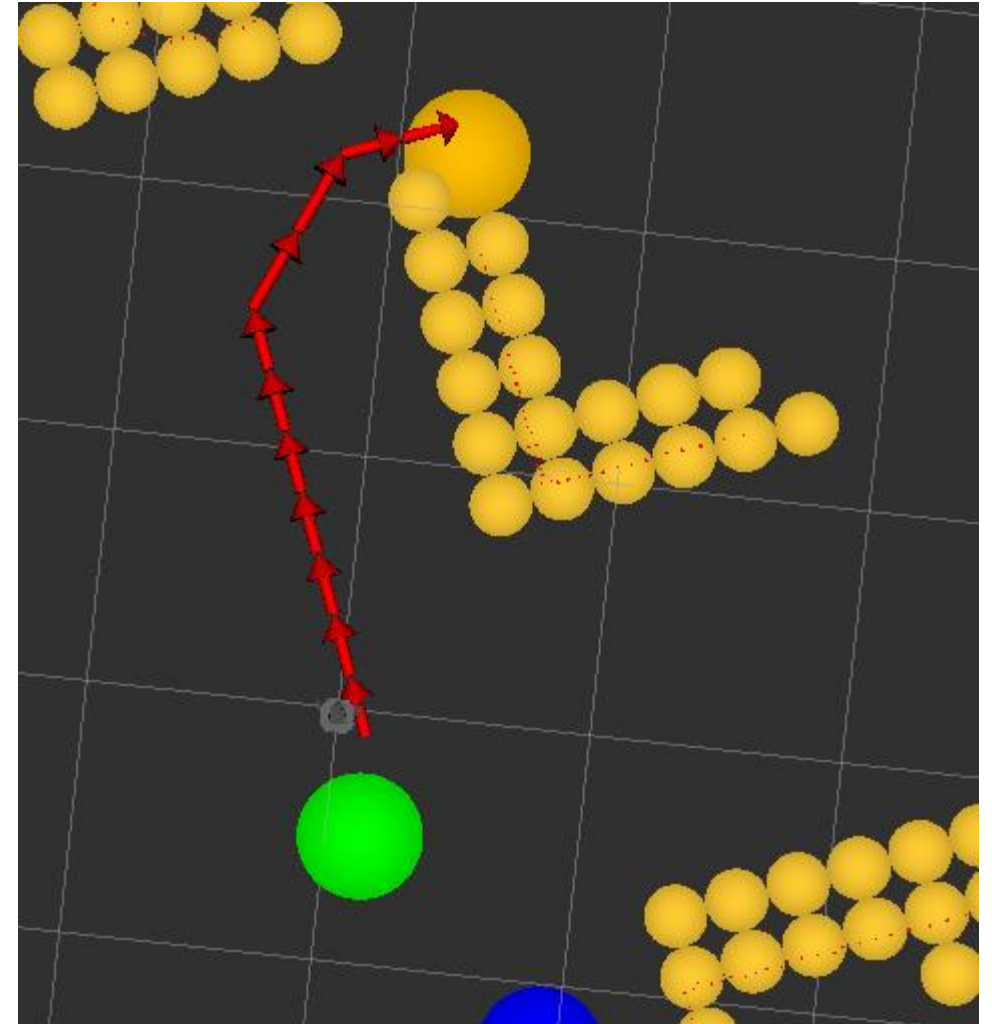
Obstacle detection

1. Loop laser ranges
2. Convert range to cartesian
3. Mark grid cell as obstacle



Path finding

- A* search algorithm
 - $f = h + g$
1. Open list using min heap
 2. Loop until open list is empty
 3. Take current position with lowest f score from open list
 4. Check if current position is end position
 5. Expand children and calculate $f = h + g$
 6. Add children to open list



Goal selection

- Nearest neighbor algorithm (greedy)

```
min_distance_reward = None
nearest_goal = None

for goal in goals:
    path_distance = calculate_path_distance(goal)
    distance_reward = path_distance * (1 / goal.reward)
    if distance_reward < min_distance_reward :
        min_distance_reward = distance_reward
        nearest_goal = goal

return nearest_goal
```

Thanks for listening