Initial Design for Restaurant Challange

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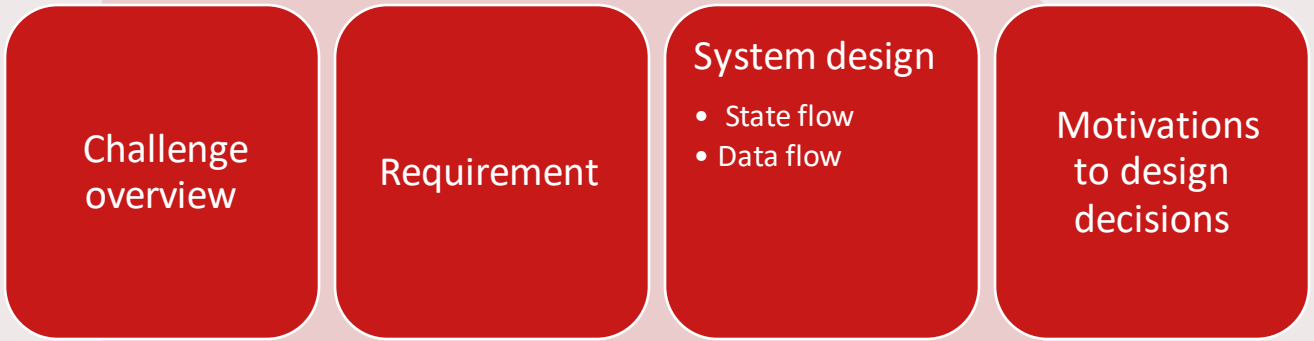
Content


Challenge overview
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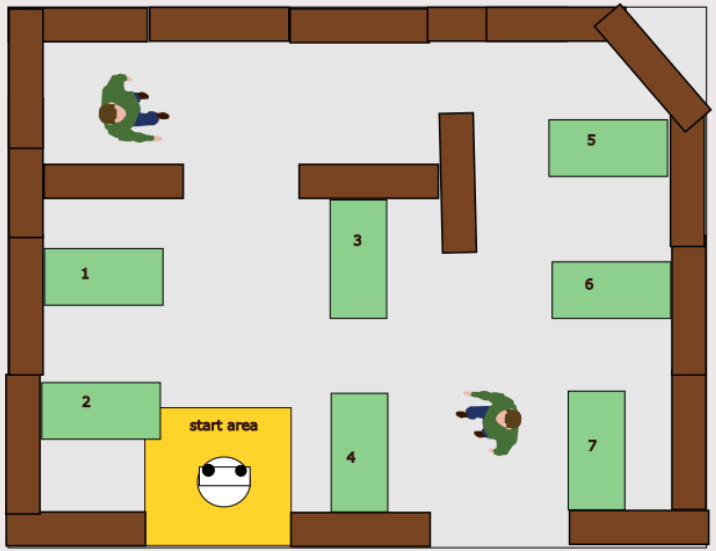
Challenge Overview



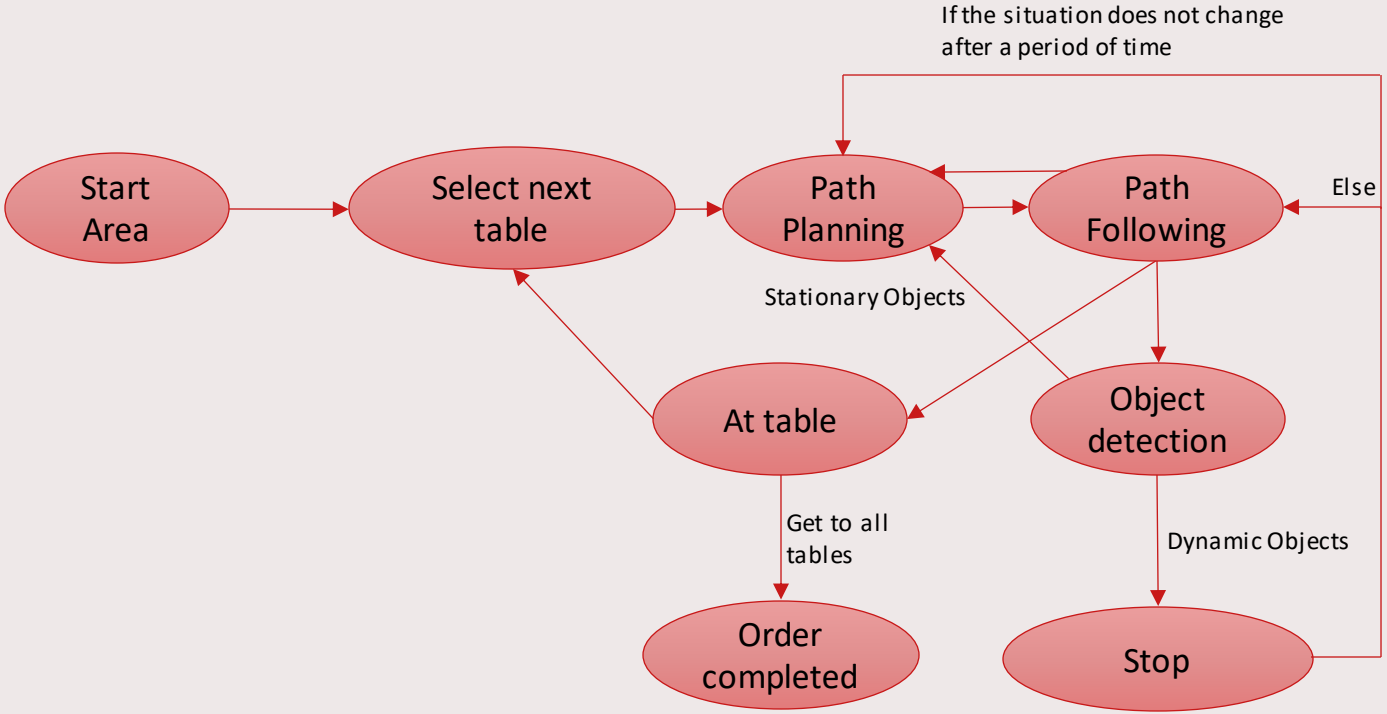
Challenge:

- Make Hero navigate this restaurant environment
- Visit every table in order
- Avoid obstacles such as walls
- When arrived at a table, face it and give a clear signal
- Repeat until there are no more tables to visit

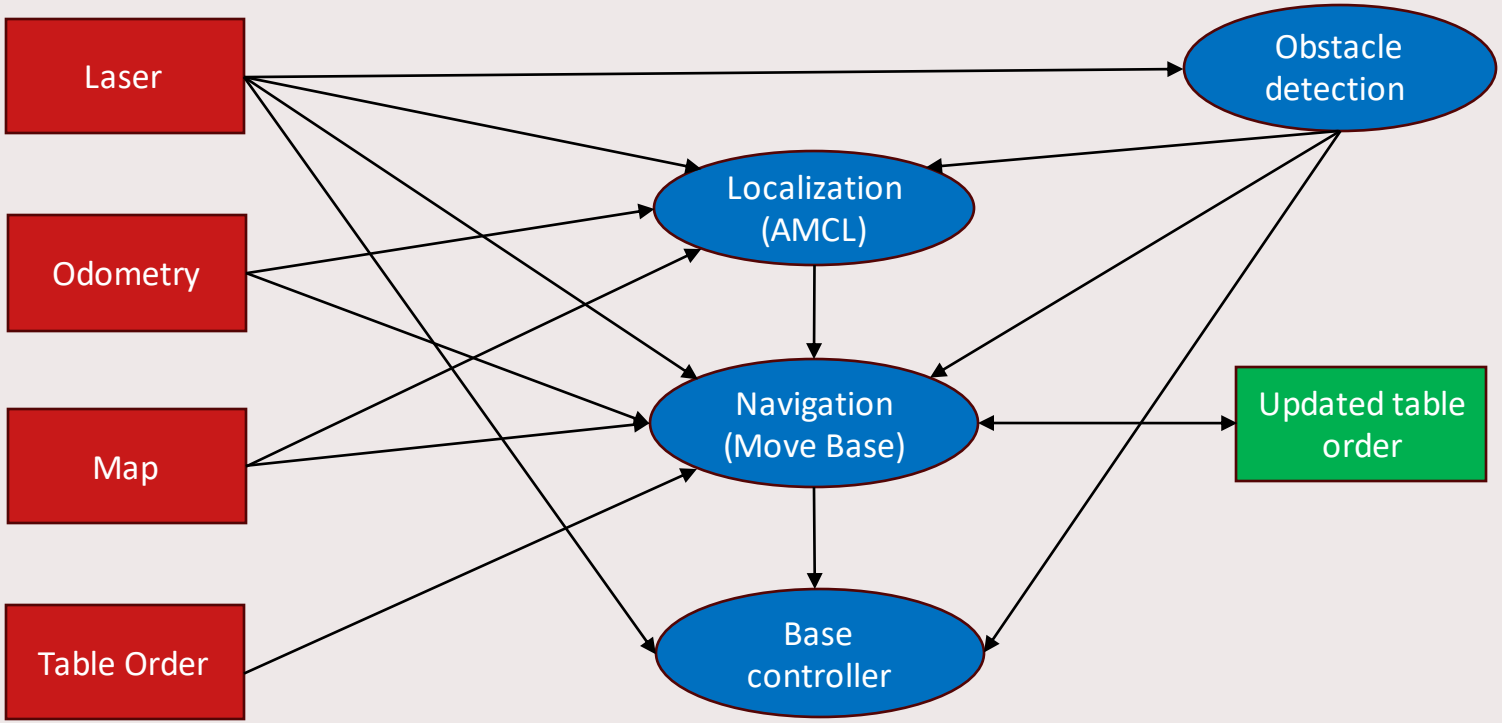
Requirements

Environment	Border	System
Autonomous operation	Keep distance to obstacles of at least 0.5 meters when moving	Maximum angular & linear velocity
Must not cause a collision	Stand still when a human is within a 1 meter range	Maximum angular & linear acceleration
Predictable movements	Take shortest path	Minimum number of laserpoints
Deliver orders	Stop time	

System design – state flow



System design – data flow



Motivations to Design Decisions

Navigation: Move Base

- Shortest path planning
- Local path planning

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- Find the shortest route to destination.
- Navigate around the known obstacles.
- Real-time decisions for unknown obstacles.

Localization: AMCL

- Map matching
- Adaptive particle filtering
- Integrate data from sensors

→

- Detect dynamic obstacles.
- Better localization for dynamic environment.

Questions