The Iron Giant's System Architecture proposal

4SC020: MOBILE ROBOT CONTROL

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Figure 1: Hero robot

System Architecture: State Diagram

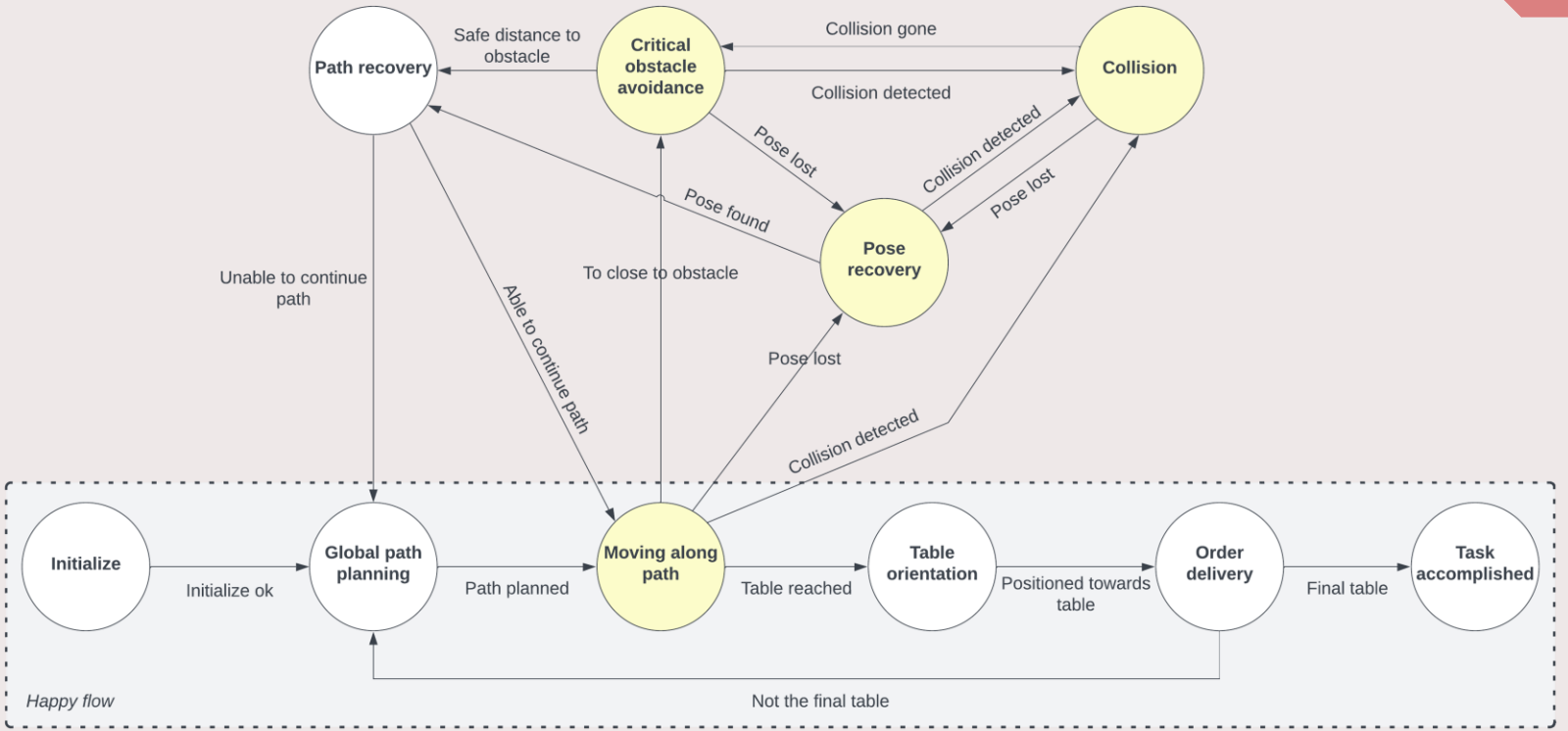


Figure 2: State Diagram

System Architecture: Desires to Specs diagram

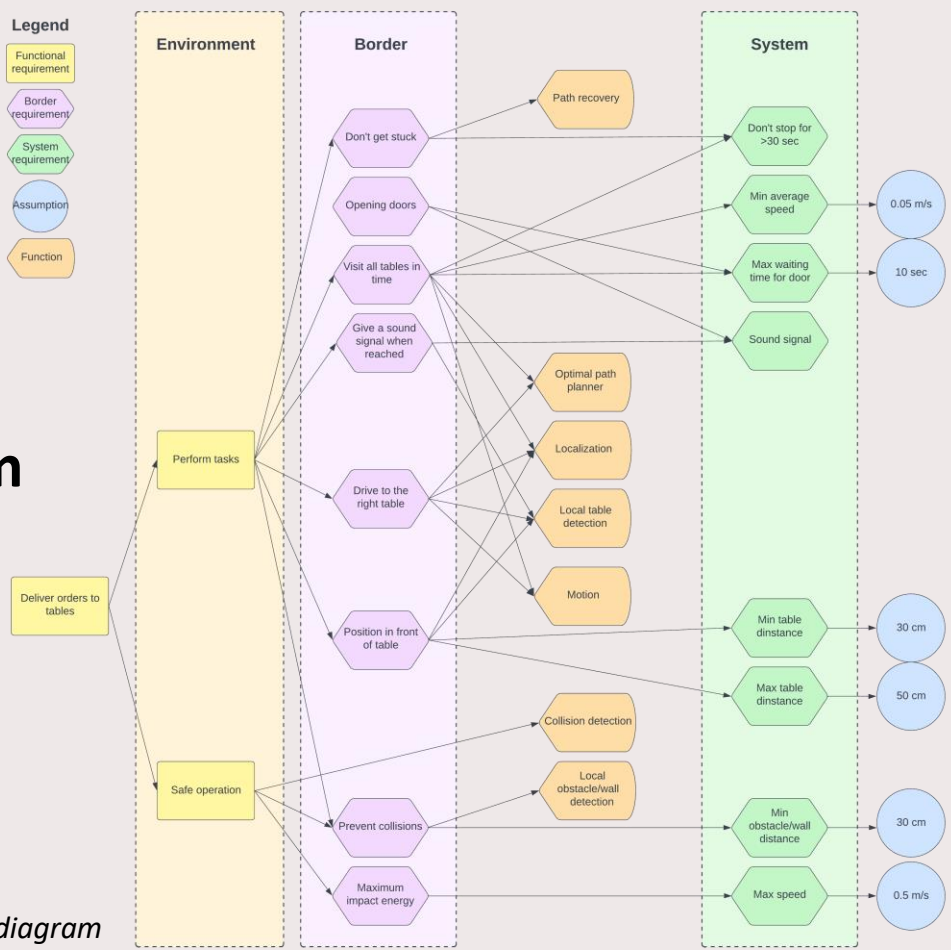


Figure 3: Desires to Specs diagram

System Architecture: Data flow diagram

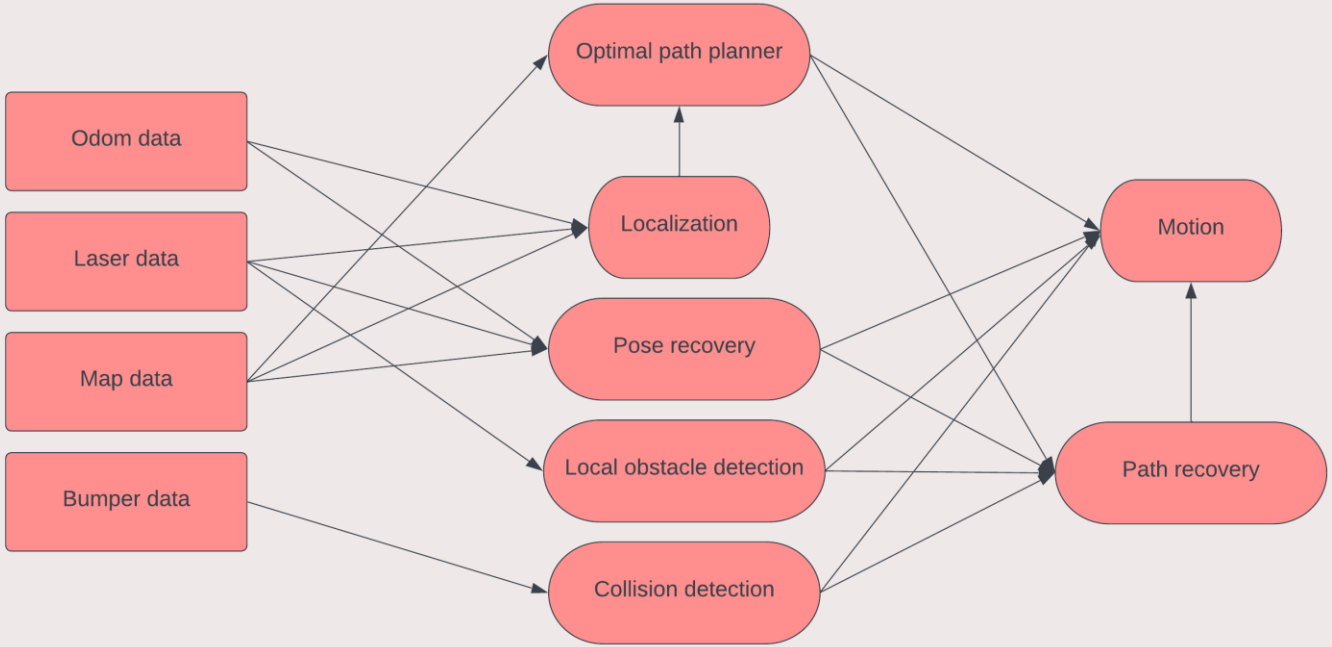
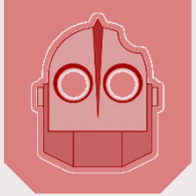


Figure 4: Data flow diagram

Implementation Plan



Global path planning

Determining shortest path to next table with A*.

- Experience with method due to Navigation-1.
- Relatively quick way of computing optimal path.
- Compatible with available data.

Local path planning

Local trajectory generation around obstacles using Artificial Potential Field Algorithm.

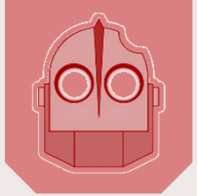
- Experience with method due to Naviagation-2.
- Quick obstacle avoidance combined with goal / path tracking.

Localization

Localization of robot in map by means of the Particle filter.

- Experience with method due to Localization-2.
- Compatible with map and Odom data.
- Relatively accurate of localization in stochastic environment.

Future steps



- Compare different assignments
  - Choose best local path planner
  - Choose best global path planner
  - Choose best localization code
- Start making base code: Happy flow
  - Planner and localisation code combination and integration
  - Happy flow feature expansion
- Non-happy flow feature inclusion