Initial design EMC - Group 1

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Where innovation starts

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Goal

- **Corridor challenge:** The robot should drive through a corridor and take the first exit left/right

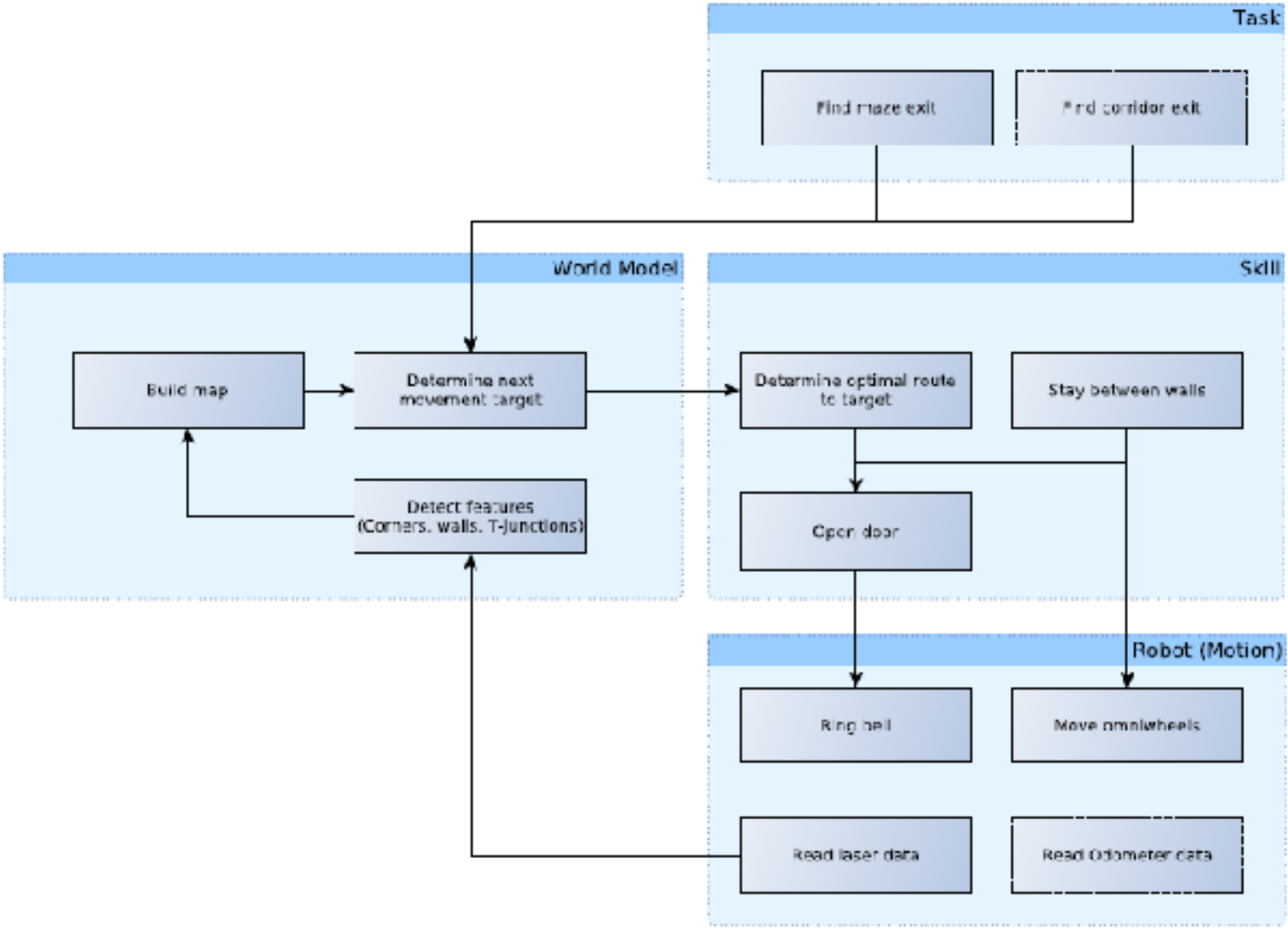
- **Maze challenge:** The robot should drive through a maze and find the exit

Requirements

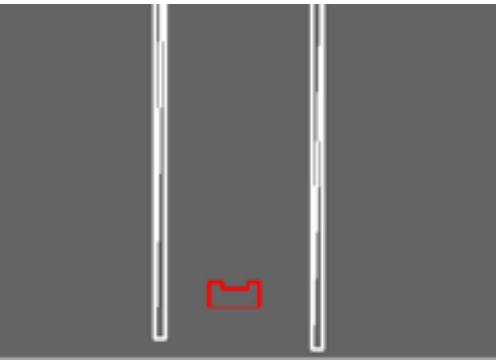
- Achieve the goal as fast as possible
- Do not dump into walls
- Move autonomously
- Do not stand still for more than 30 seconds

- For the maze challenge:
  - Be able to open doors
  - Deal with open spaces and loops
  - Be able to reconstruct the maze

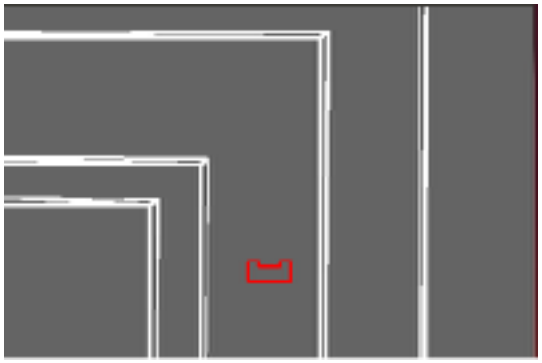
System model



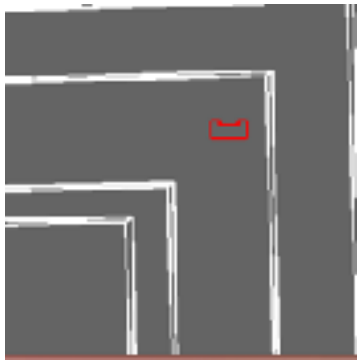
Approach



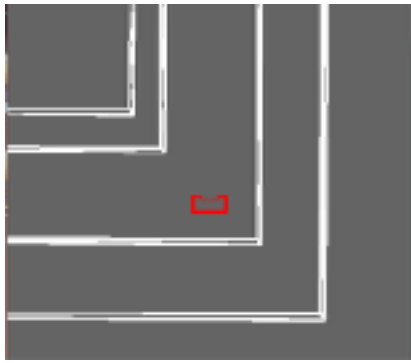
Drive forward



Recognise node



Move towards node

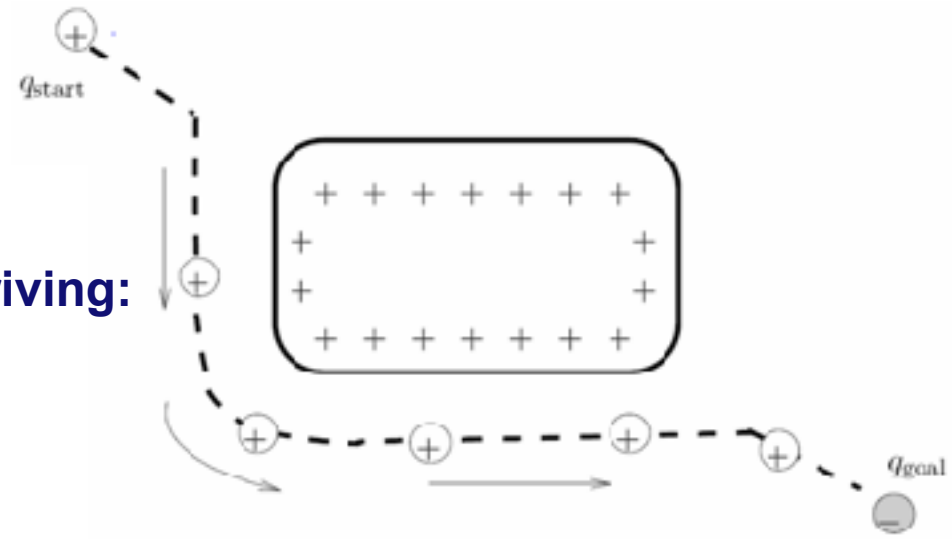


Turn 90°

Possible methods

- **Maze solving algorithms:**
  - Random Mouse
  - Wall Follower
  - Pledge
  - Trémaux

- **Potential field - Autonomous Driving:**
  - Avoids wall collisions
  - After detection and movement target
  - Repulsive forces: walls
  - Attractive forces: setpoint



Source: http://www.cs.cmu.edu/~./motionplanning/lecture/Chap4-Potential-Field_howie.pdf