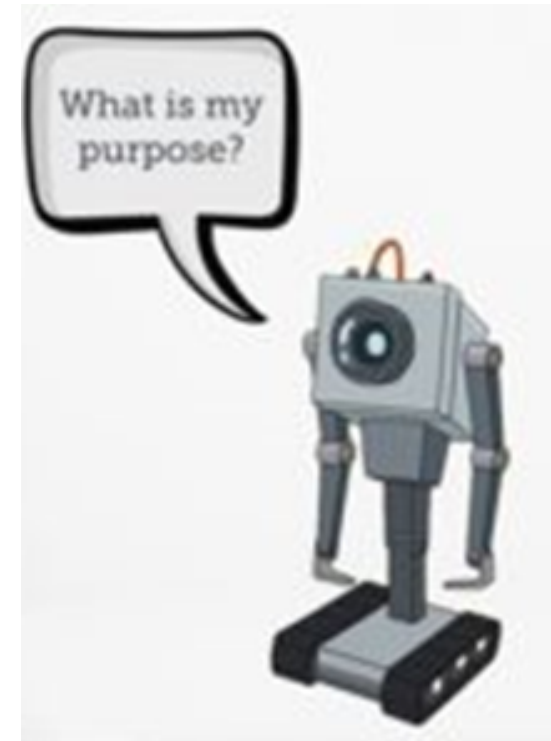# Final design EMC - Group 1

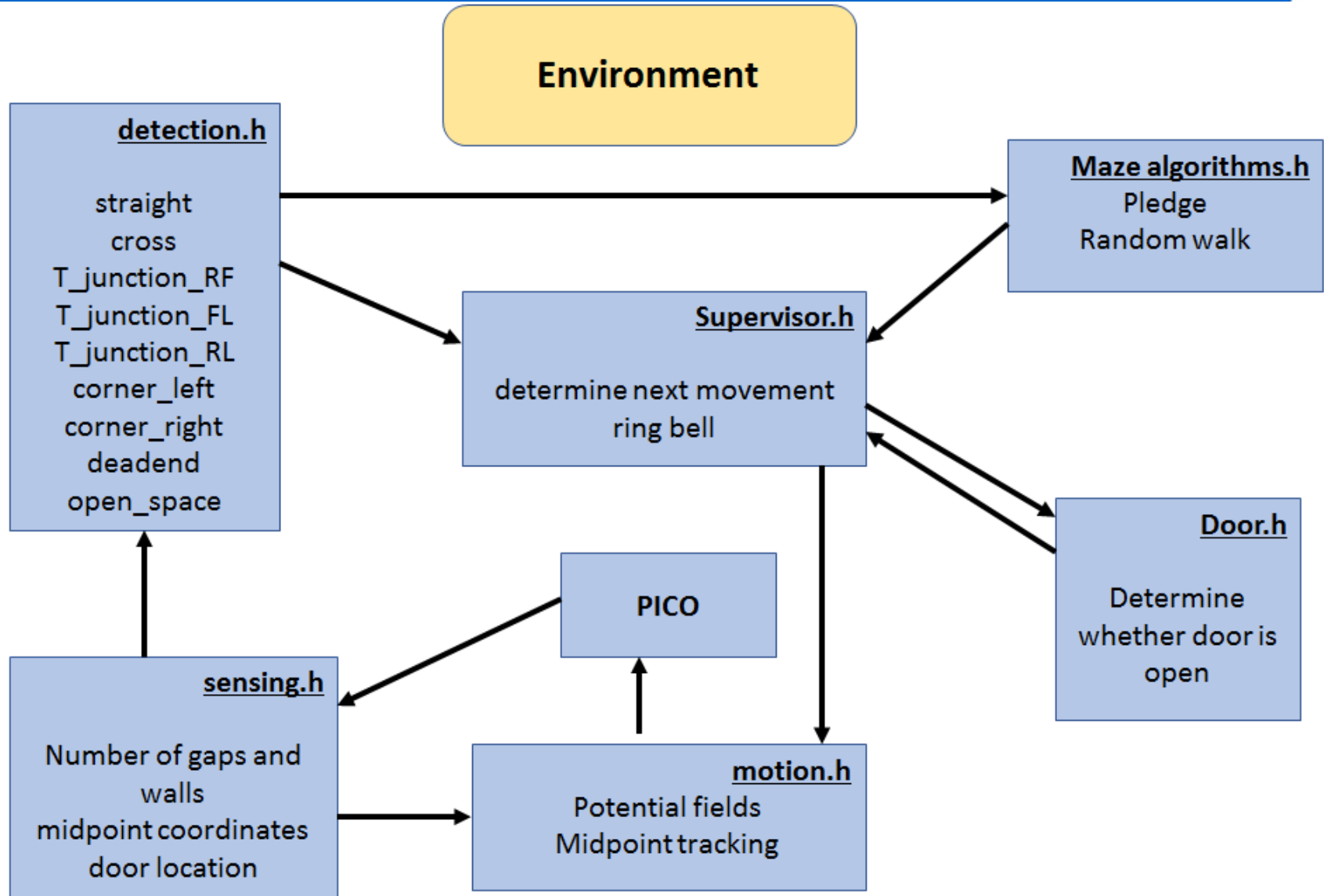Karel van de Plassche   0653197
Joey H.T. Hendriks   0773023
Ioannis-Dionysios Bratis   0978560
Jad Haj Mustafa   0979428
Jip Reinders   0853301
Juliana Langen   0988532

Contents

- **Software design**
  - Flow chart
  - Sensing/Detection
  - Motion
  - Maze-solving strategy
  - Doors

- **Current progress**
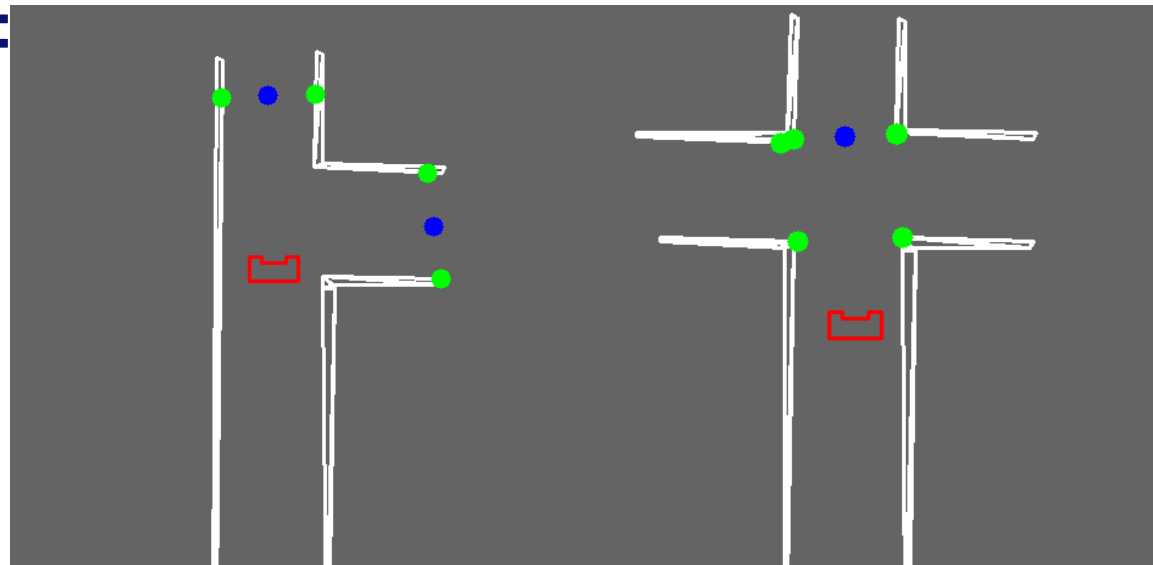- **Things we've learned**

Flow chart

Environment

detection.h

straight
cross
T_junction_RF
T_junction_FL
T_junction_RL
corner_left
corner_right
deadend
open_space

Maze algorithms.h
Pledge
Random walk

Supervisor.h

determine next movement
ring bell

Door.h

Determine
whether door is
open

PICO

sensing.h

Number of gaps and
walls
midpoint coordinates
door location

motion.h
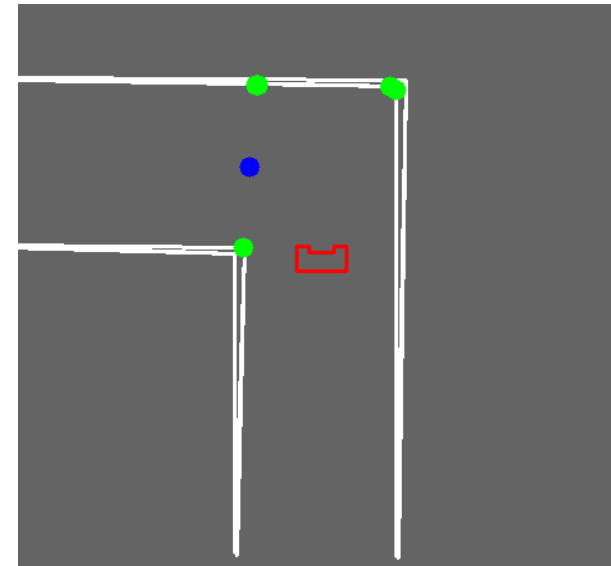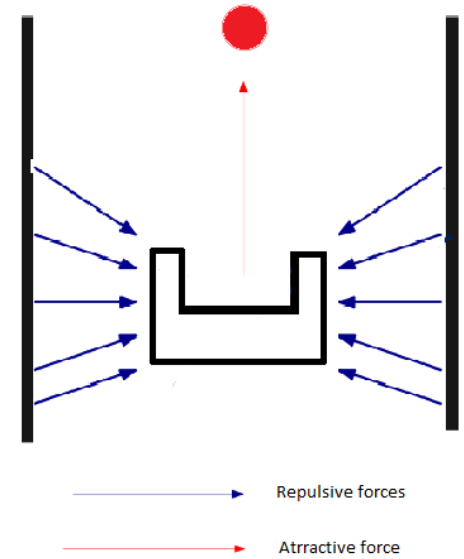Potential fields
Midpoint tracking

Sensing/Detection

- **Recognizing nodes:**
  - Junctions, dead-ends, open spaces, doors

- **Set maximum laser range:**
  - Wall or gap

- **Midpoint detection:**

Motion

- **Potential field**
  - Re-used corridor challenge script
  - Exponential repulsive force

- **Midpoint tracking**
  - Following the midpoint

Repulsive forces

Attractive force

Maze-solving strategy

- **Pledge algorithm**
  - Keep going straight when facing initial direction (count=0)
  - If count != 0, PICO prefers to go back to count = 0

  - Mapping not needed: always starts inside the maze

- **Random-walk**
  - Back-up plan

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Eindhoven
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Current progress

- **Detection:**
  - Node recognition: junctions and open spaces
  - Door(area) recognition

- **Motion:**
  - Potential field
  - Midpoint tracking

- **Maze-solving algorithm:**
  - Pledge
  - Random-walk

- **Other:**
  - Wiki

Things we've learned till now

- **Simulation != experiments**
- **Focus on robustness**
- **Divide the script in modules**
- **Communication is key**

  - **Hard work sometimes pays off!!!**

Questions