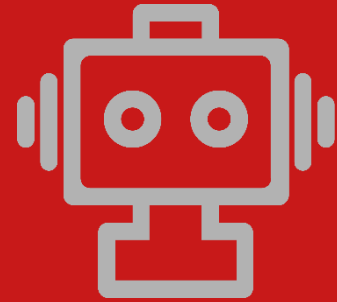# Hospital Design

Embedded Motion Control [4SC020]

Group 9; Nicole Huizing, Janick Janssen, Merijn Veerbeek

Introduction

- Hospital Challenge

Obtain and deliver medicines autonomously, and safely in a partly unknown environment.
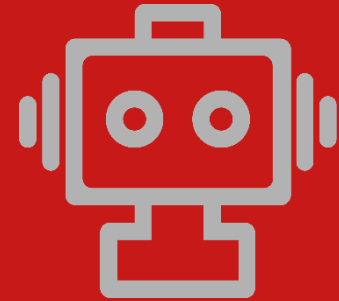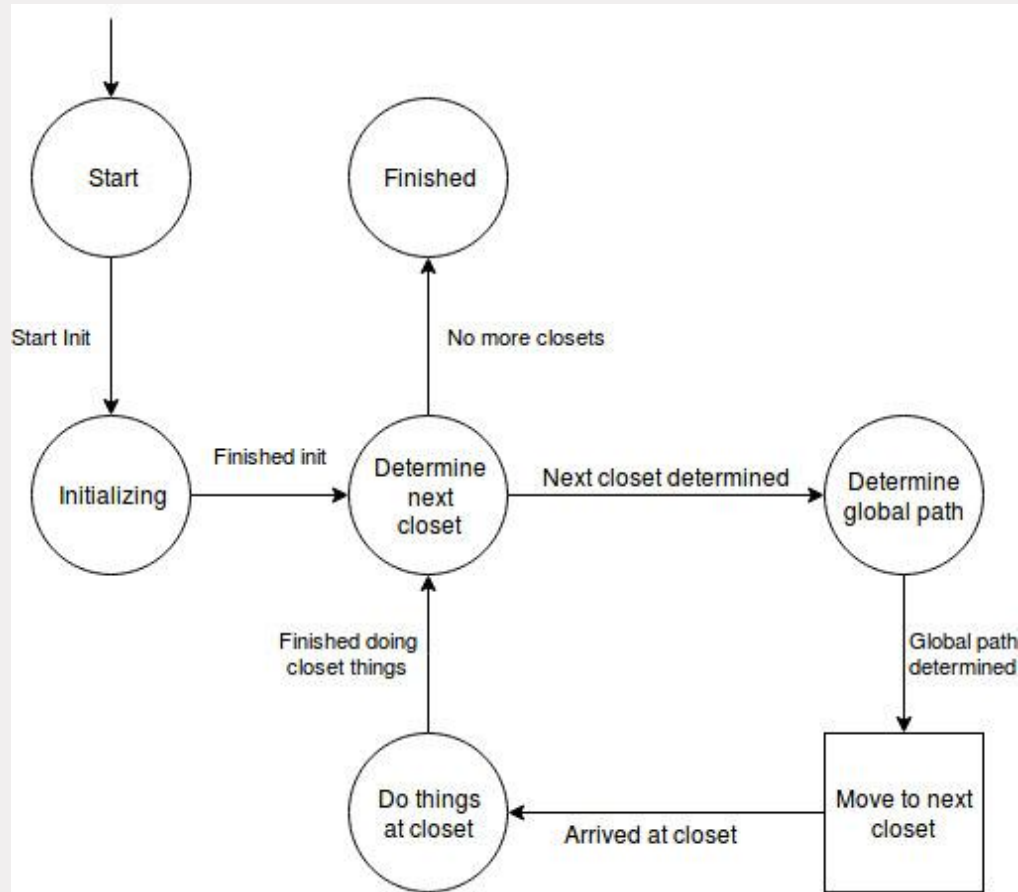
Requirements

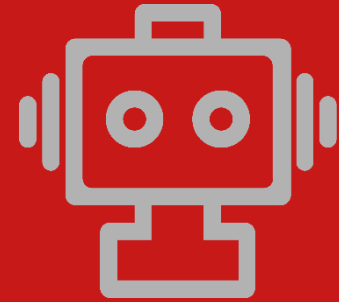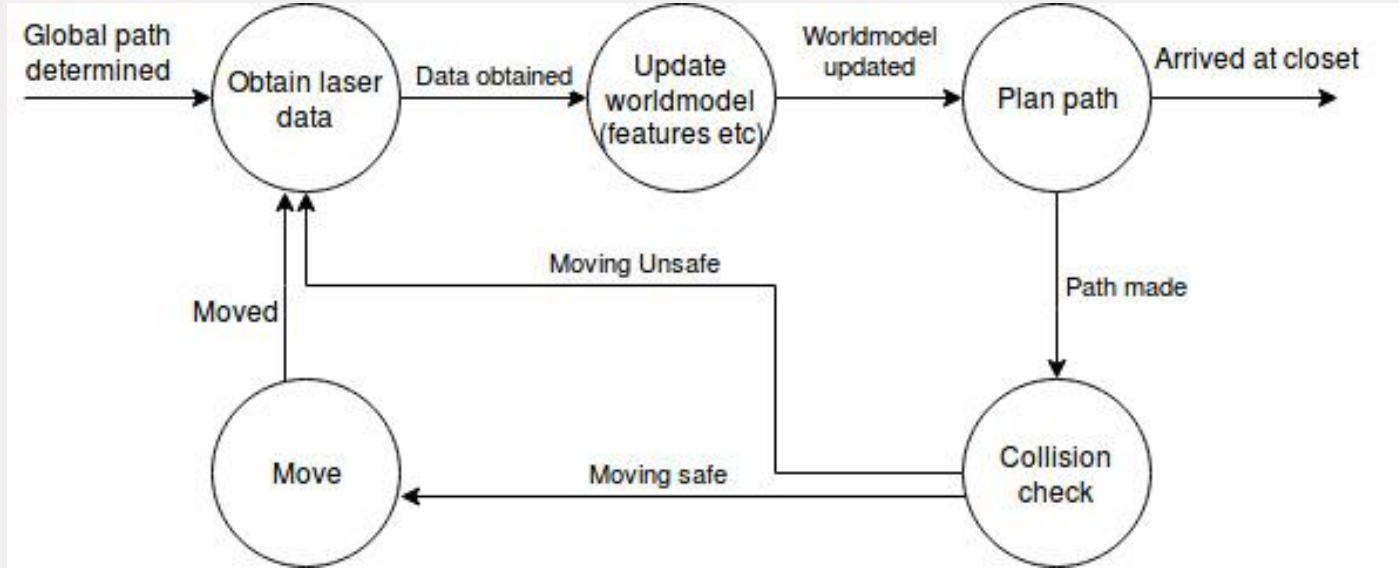| Hospital		
Visit cabinets in given order	Plan paths	Operate autonomously
Signal cabinet visit audio	Identify (moving) objects	Avoid deadlocks or infinite executions
Save cabinet snapshot	Localize in map	Standstill time < 30 seconds
Detect features	Update map	Software easy set-up
		Time < 10 minutes
		Prevent collision

Interfaces
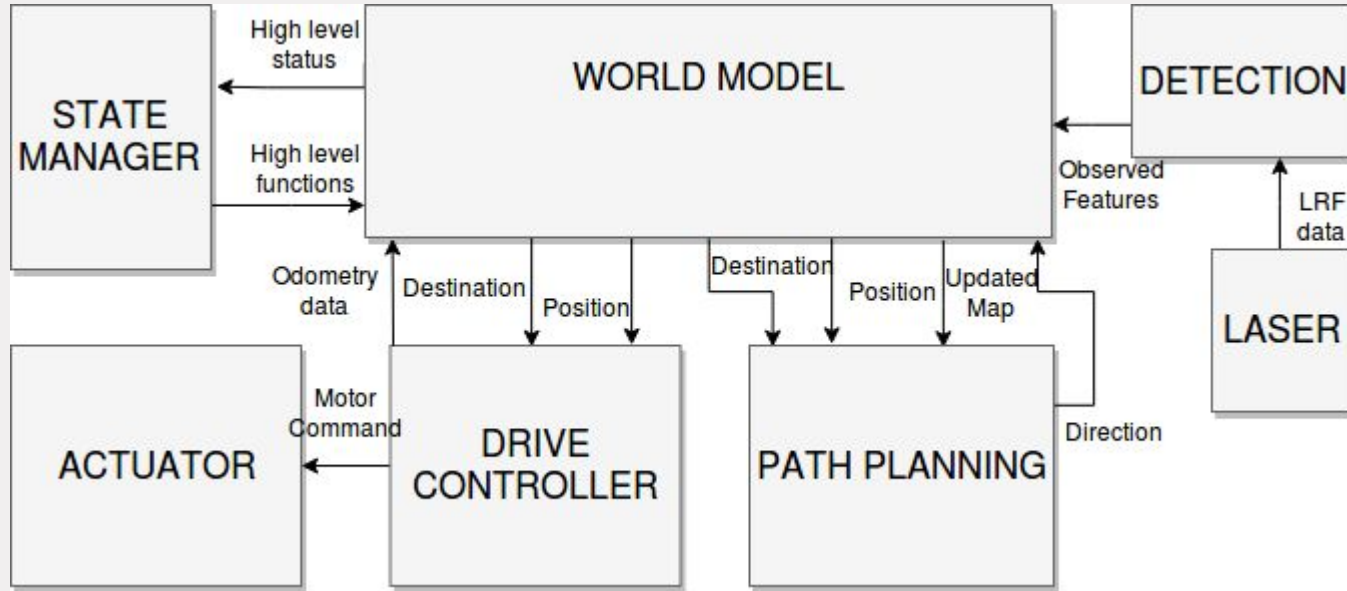
Strategy

Strategy

Functions

Low-level	Mid-level	High-level
Move (sideways, back, front)	Path following	Avoid obstacle
Rotate	Compare sensor and control data	Localisation
Obtain laser data	Detect features	Path planning
Obtain encoder data	Filter data	Read/update map
Stop		Mediation
Initialize		Monitor progress

Path planning

A* pathfinding

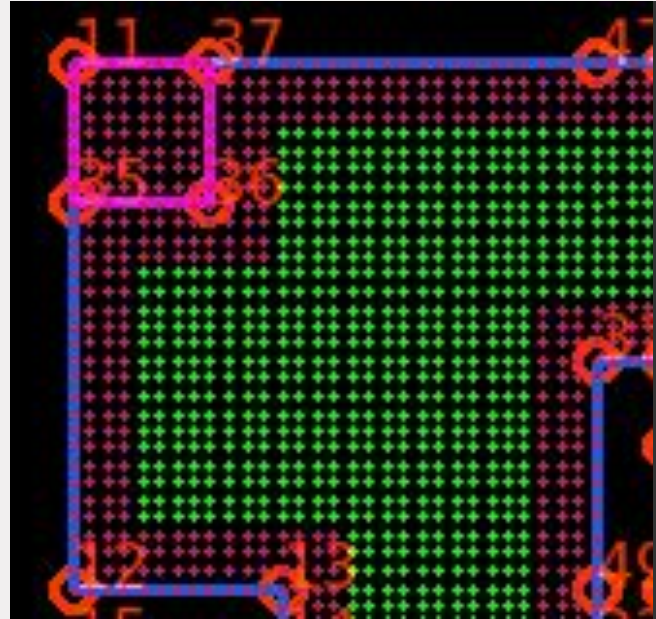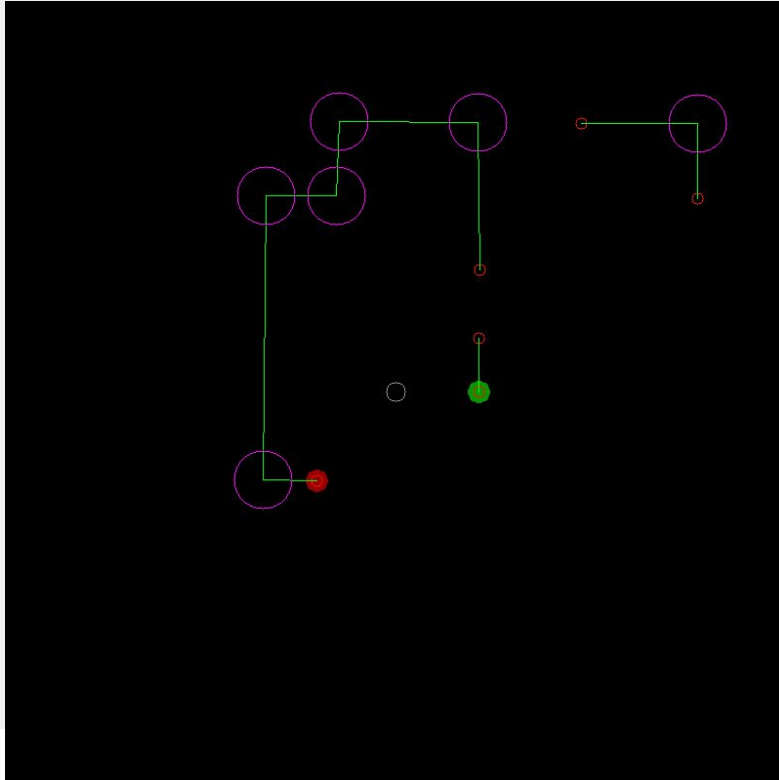Uses doors as landmarks
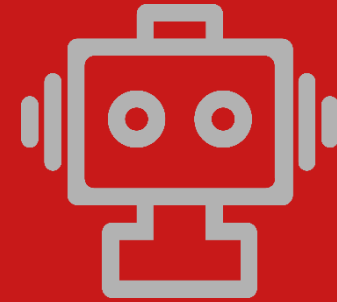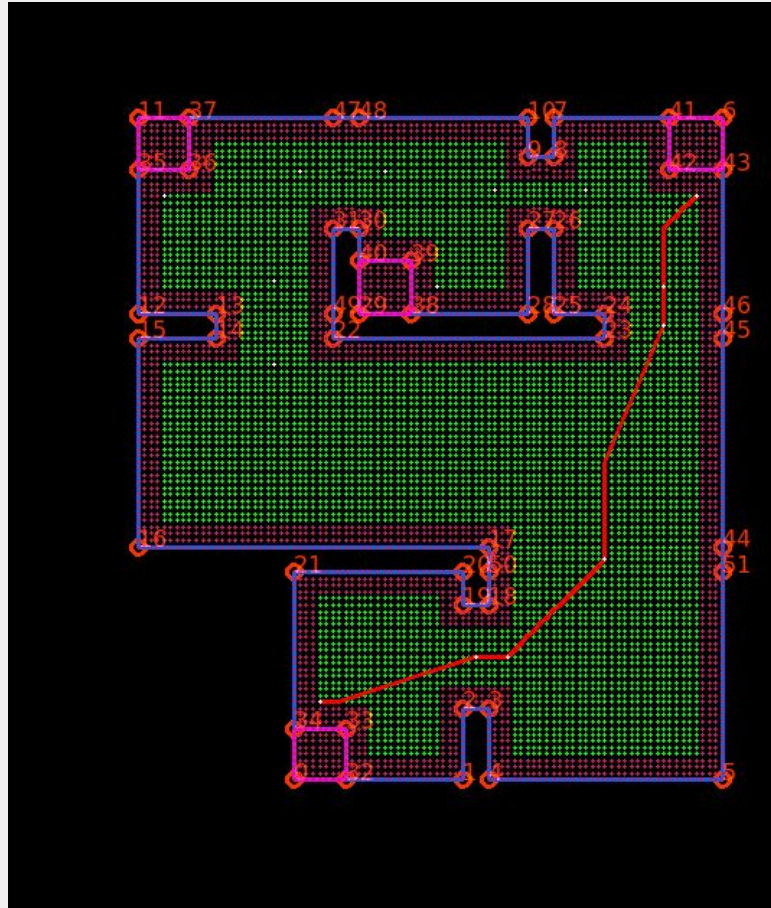
Mapping

Adaptive breakpoint detection

Least mean squares

Number of times observed

TU/e

Mapping

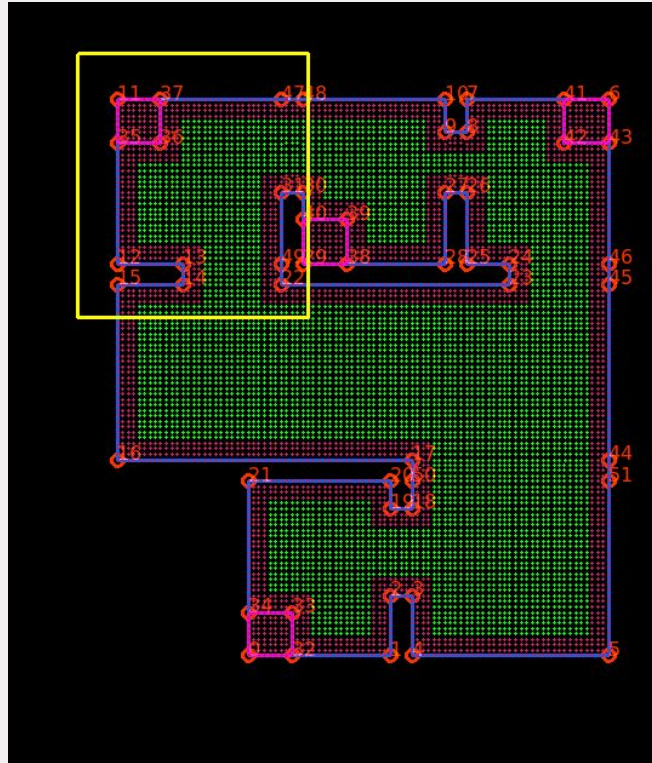# Localisation

Monte Carlo localisation

Grid based particles

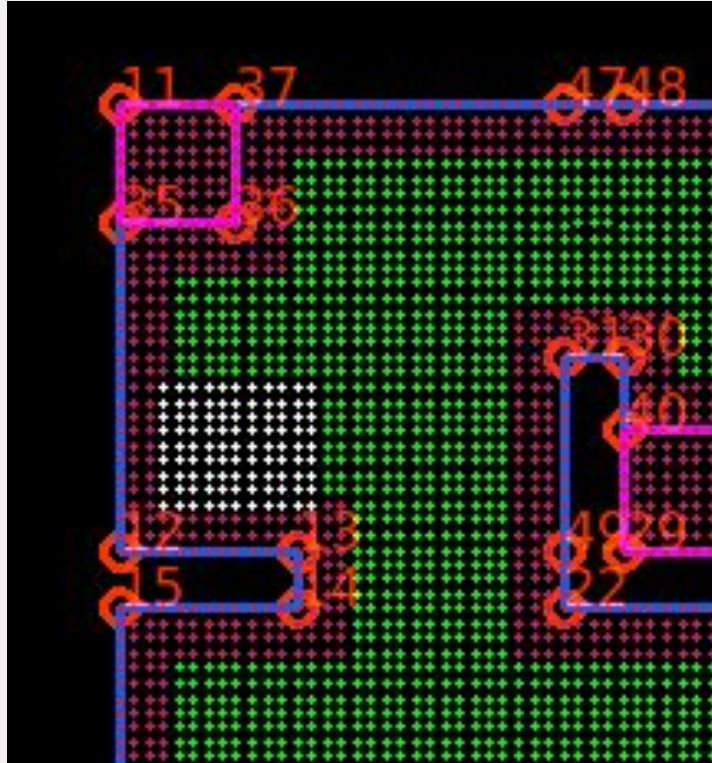Use knowledge to reduce the number of particles
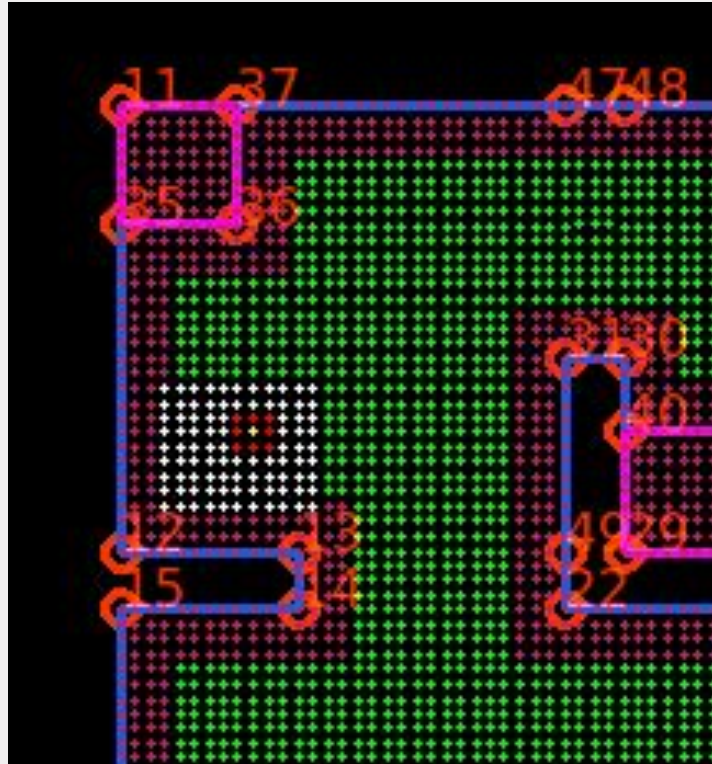
TU/e

Localisation Grid based particles

Localisation Use knowlege to reduce the number of particles

Localisation

Questions?