

Autonomous agents

Lecture 9, 20160215

Robotic behaviors III. Localization

No lecture on Thursday

- Please note that there will be no lecture on Thursday.
- That lecture is normally not used – instead, you'll have some extra time to work with HP2.

Today's learning goals

- After this lecture you should be able to
 - Describe and implement a method for localization based on laser scan matching

Localization

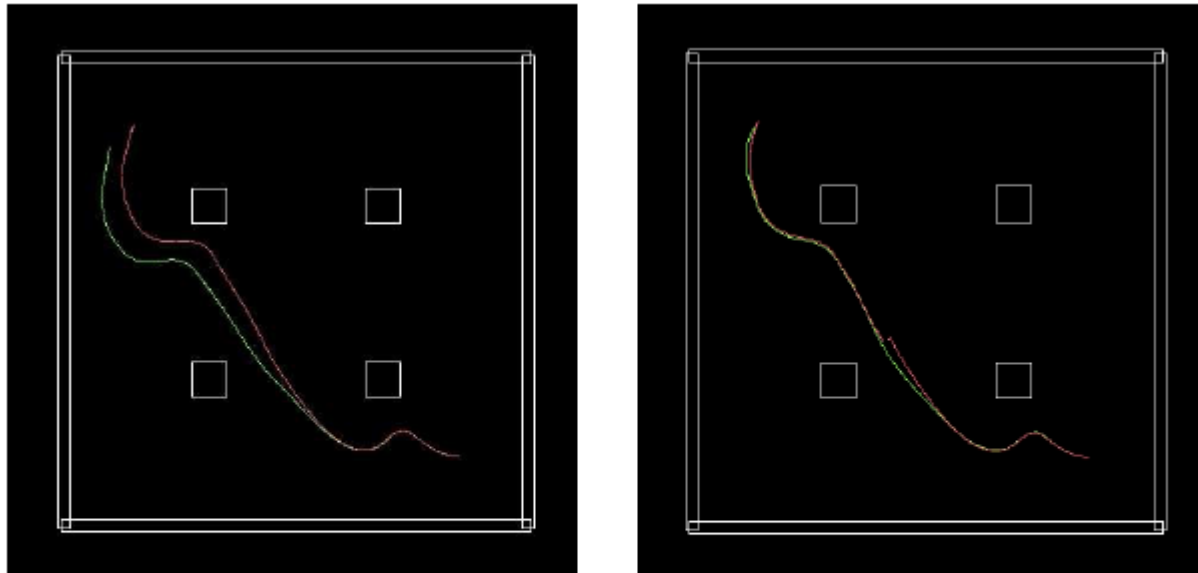
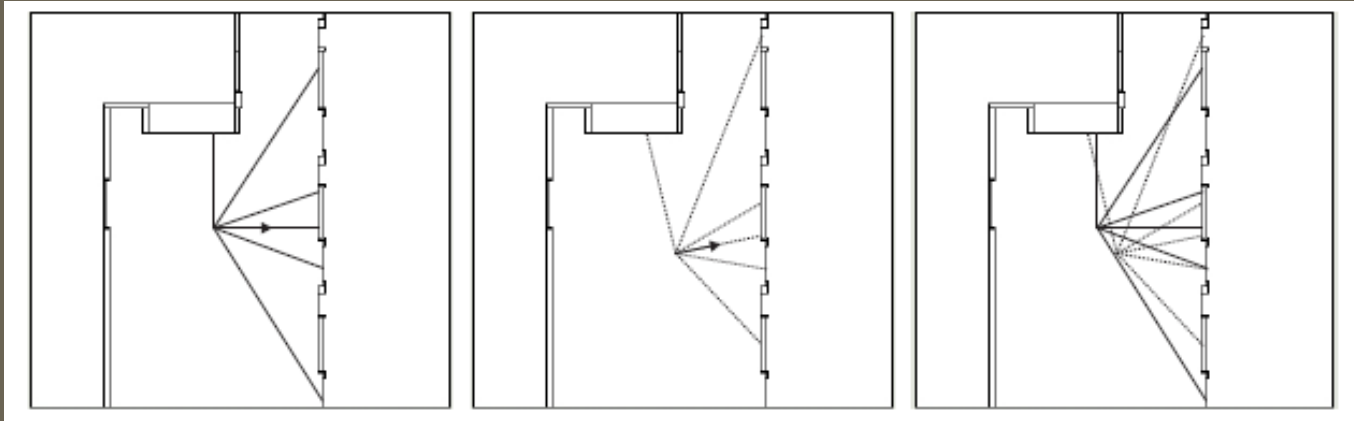
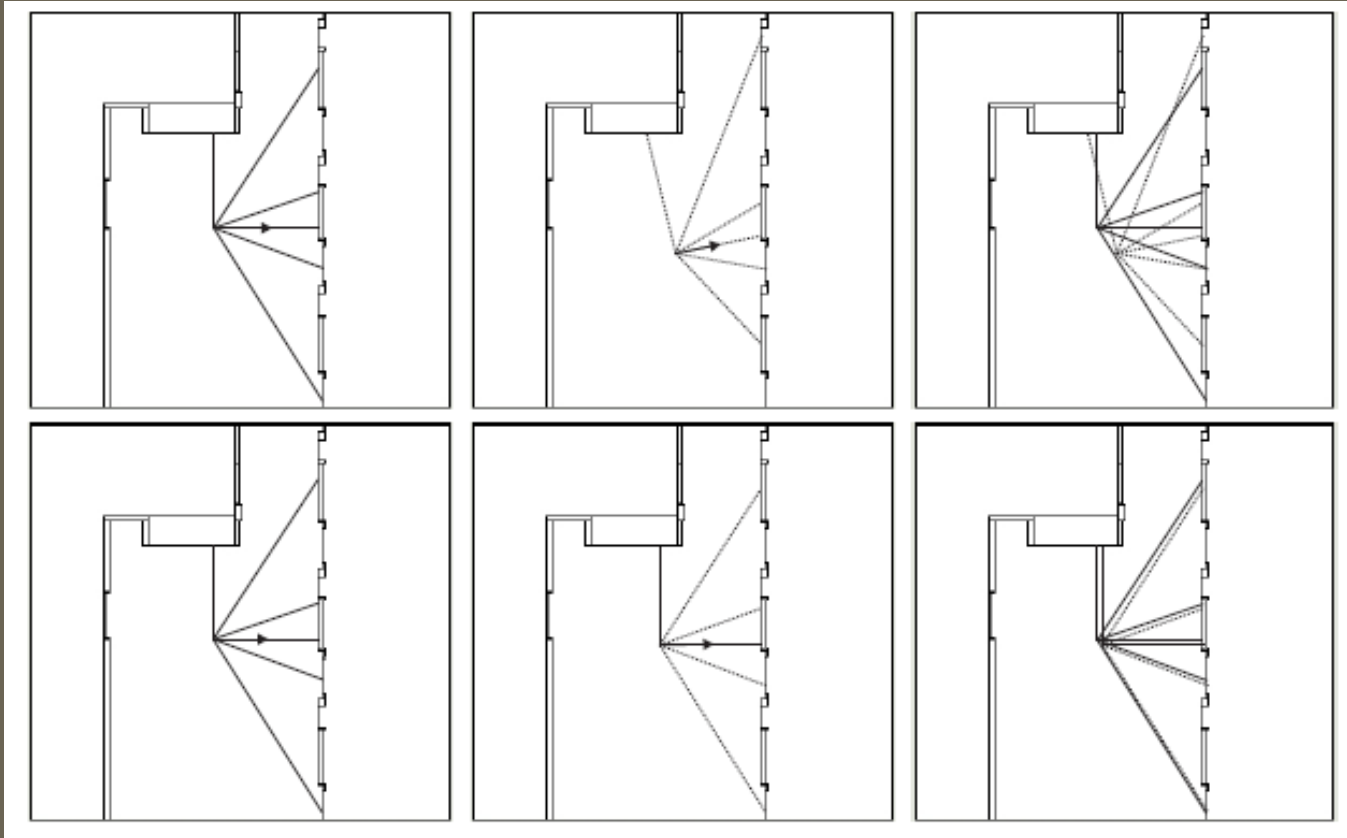


Figure 6.15: *An illustration of the need for localization in mobile robot navigation. In the left panel, the robot navigates using odometry only. As a result, the odometric trajectory (red) deviates quite significantly from the actual (green) trajectory. In the right panel, Laser localization was activated periodically, leading to much improved odometric estimates.*

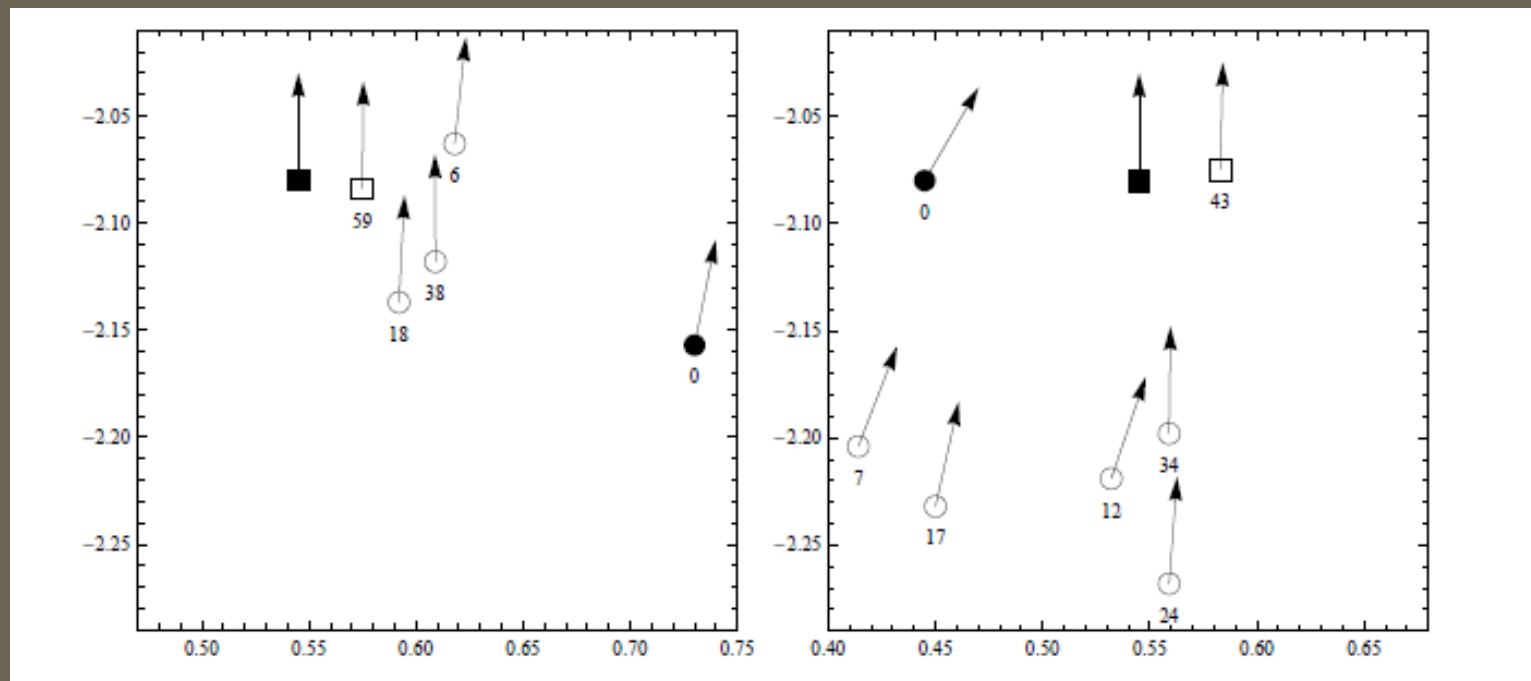
Localization



Localization



Localization



Localization

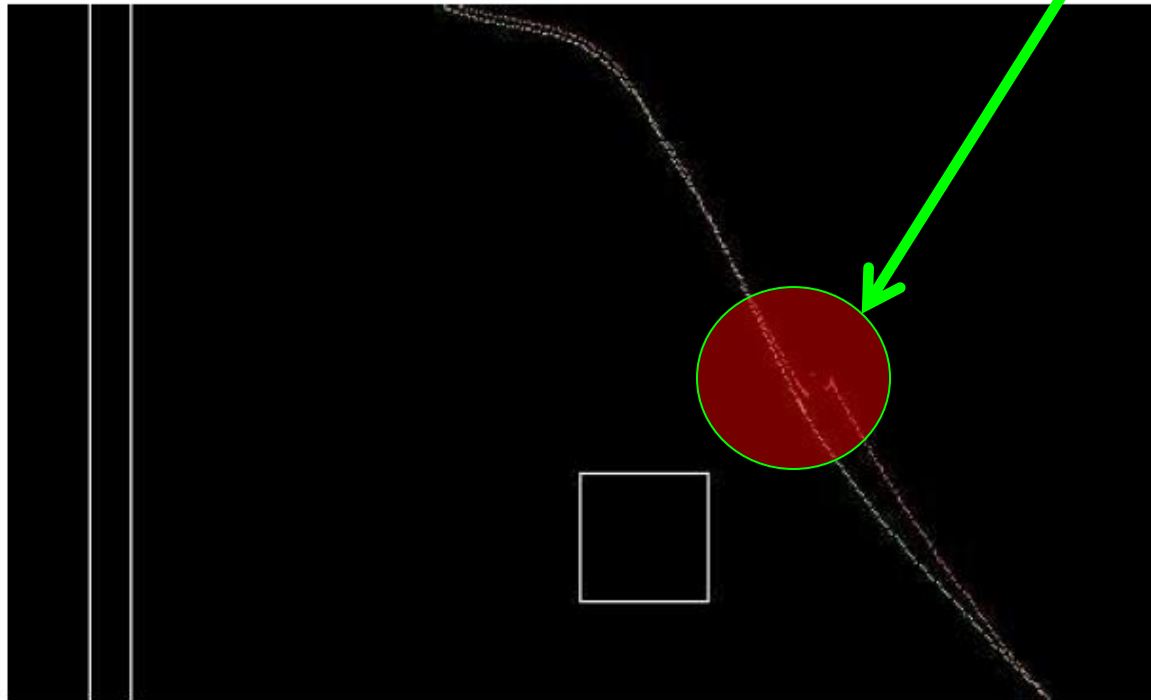
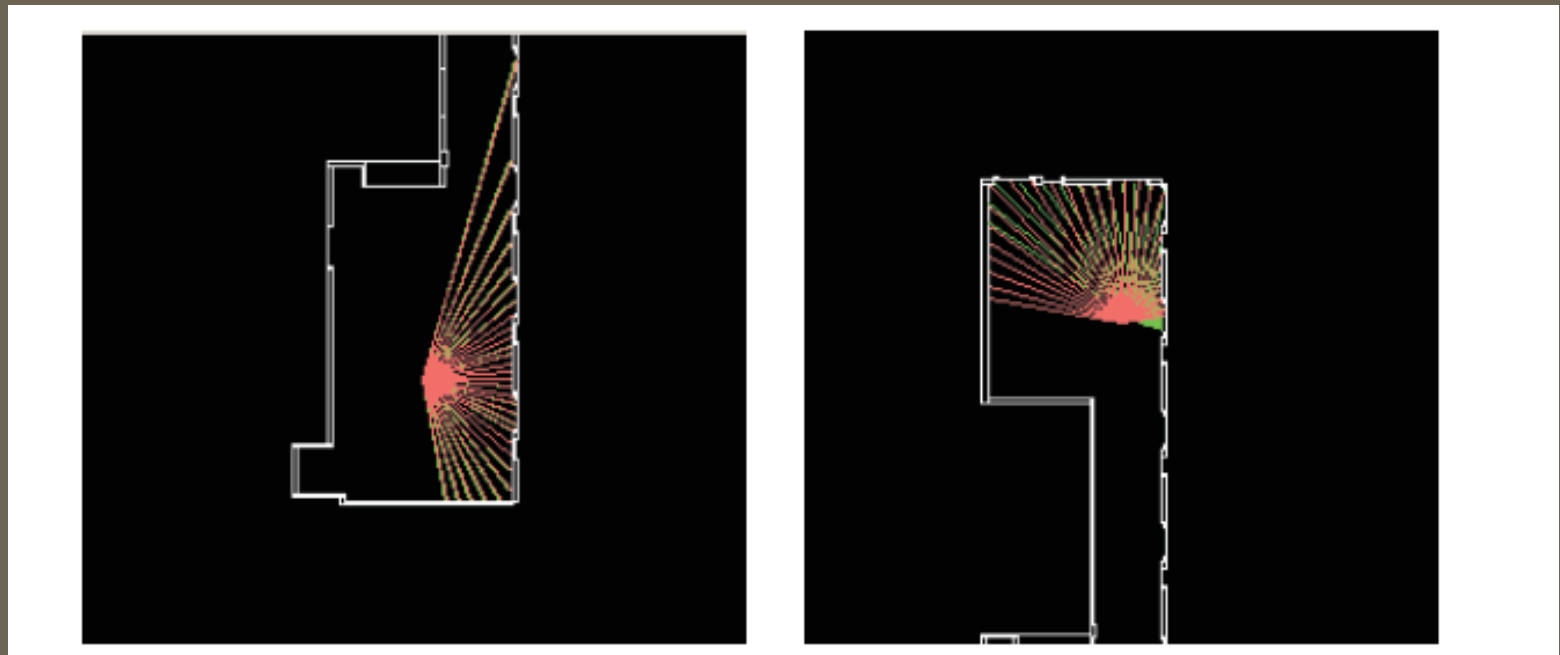


Figure 6.16: An enlargement of the most significant correction in odometric readings (in the right panel of Fig. 6.15) resulting from the Laser localization behavior.

Localization



Localization



Today's learning goals

- After this lecture you should be able to
 - Describe and implement a method for localization based on laser scan matching



Home problem 2

- Four problems
- 2.1 and 2.3 are mandatory
- Deadline: 20160307



Problem 2.1: Dijkstra

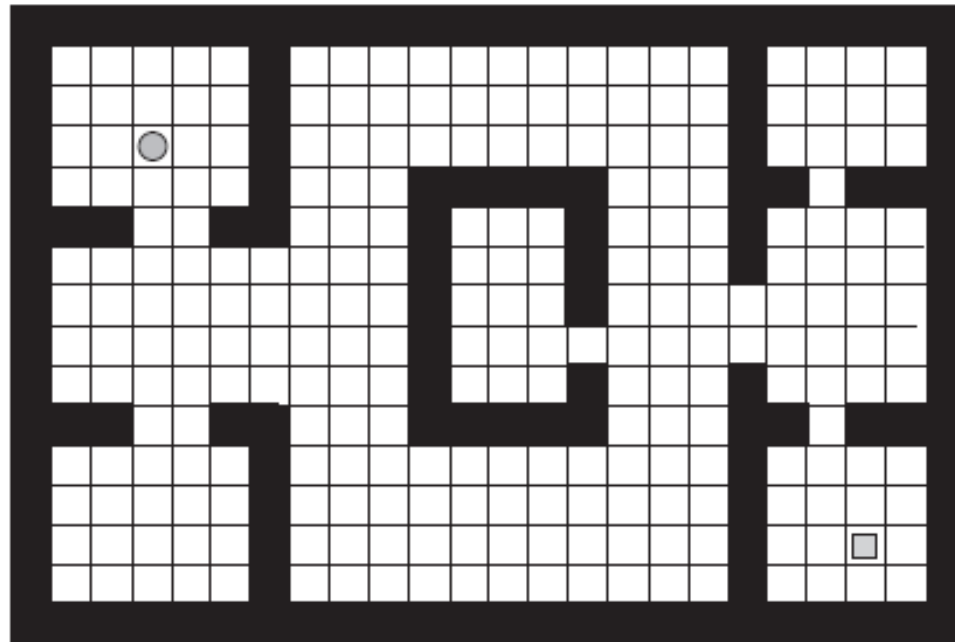
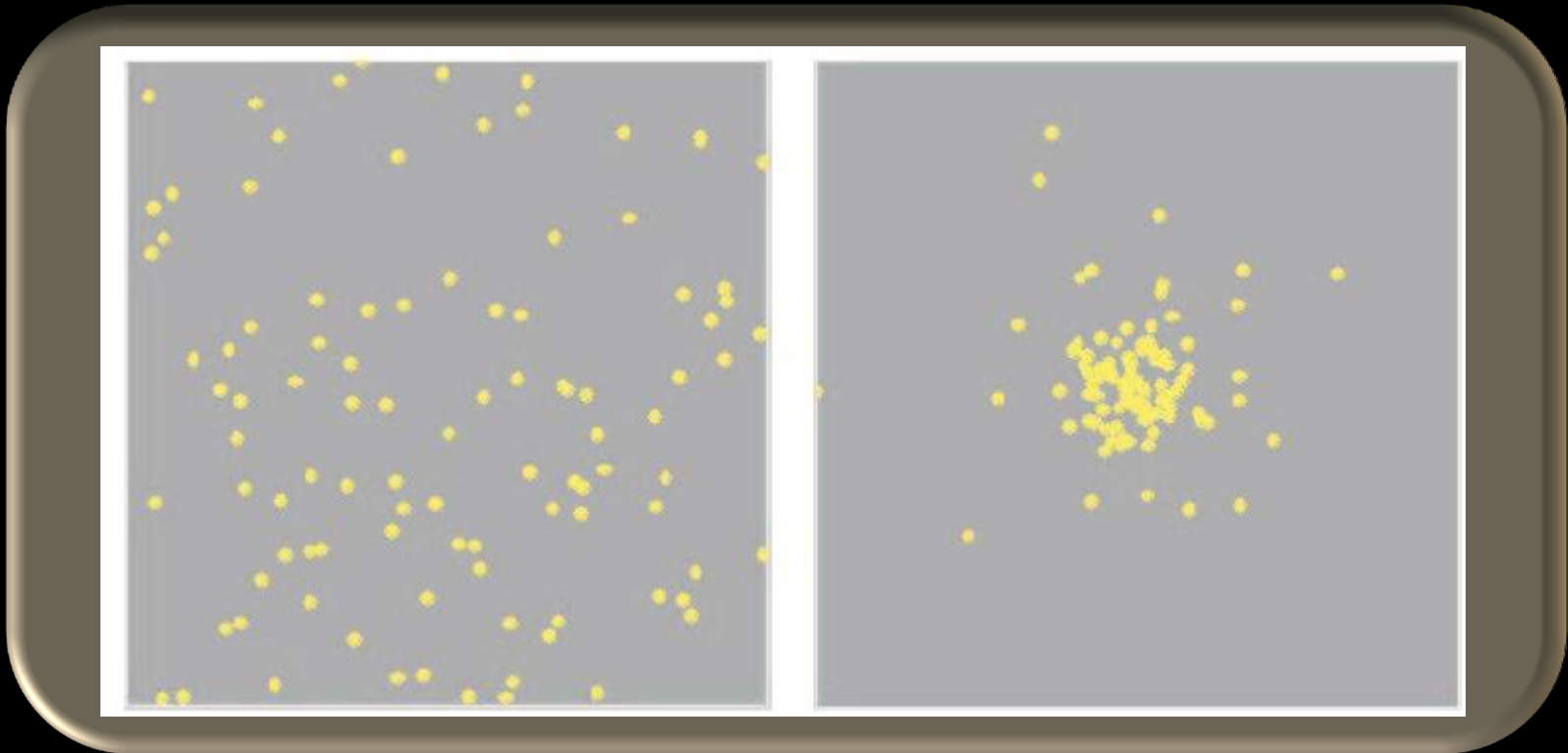


Figure 1: The arena used in Problem 2.1.

Problem 2.2: Decision-making

- Simulation of decision-making during E. Coli kinesis



Problem 2.3: Potential fields

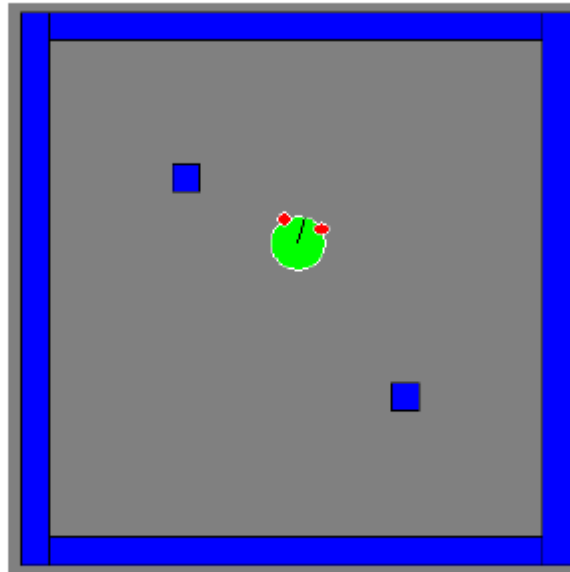


Figure 2: The arena considered in Problem 2.3.

Problem 2.4: Localization

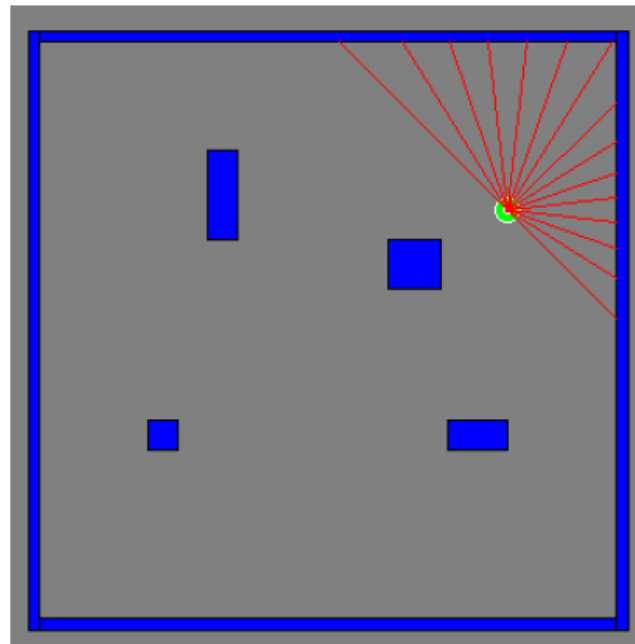


Figure 3: The arena considered in Problem 2.4. Note the 15 rays of the robot's LRF.