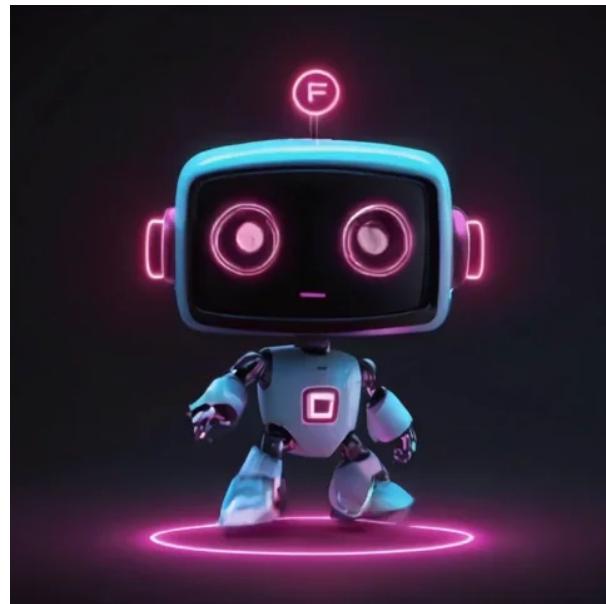


Robotics-Assignment



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Requirment 1

How It Works

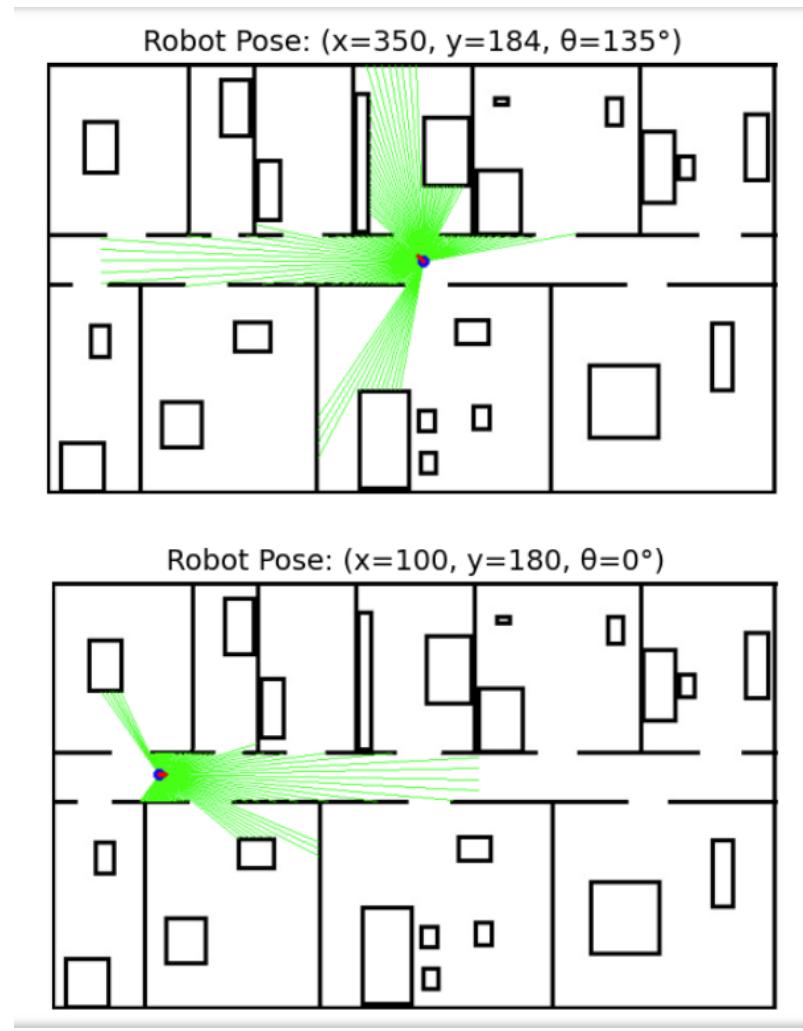
1. The `laser_measurments` function:

- Converts the input map to grayscale.
- Casts laser rays from the robot's position at angles ranging from -125° to 125°.
- Calculates the distance to obstacles and the endpoint of each laser beam.

2. The `draw` function:

- Visualizes the robot's position and orientation.
- Plots the laser beams and obstacle endpoints on the map.

Results:



Requirement 2

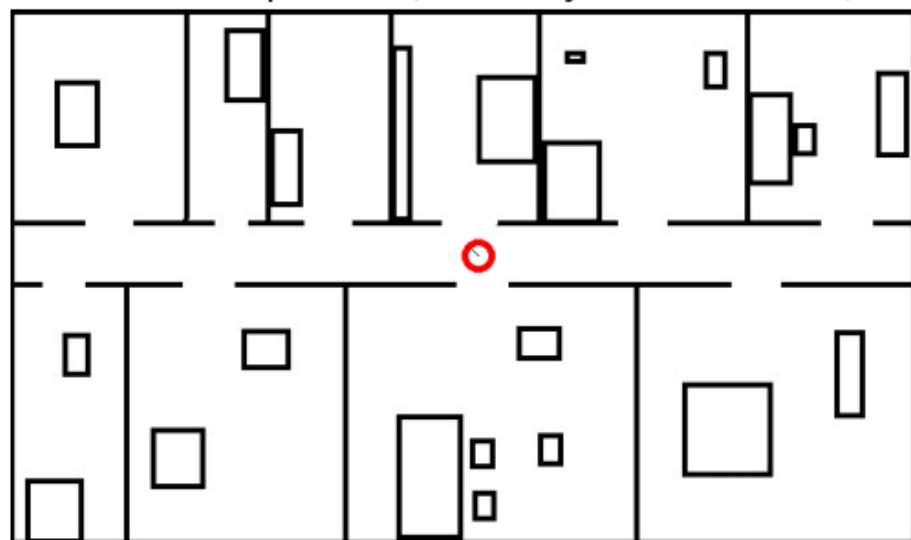
How It Works

1. Finding the Most Likely Pose: The function `find_most_likely_pose()` searches the entire map for the pose with the highest probability. It iterates over possible positions (x, y) and orientations theta to find the best match.
2. Visualization: The function `draw_pose()` displays: The robot's best pose on the map. The likelihood map showing the probability distribution.

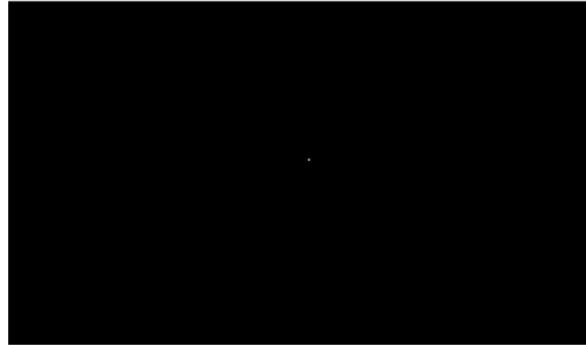
Results Given measurements from requirement 1:

first measurements

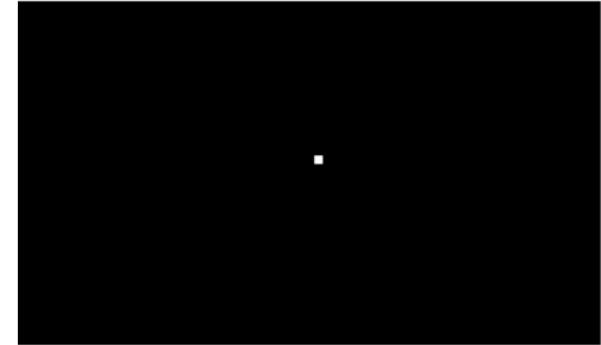
robot best position($x=350, y=184, \theta=135^\circ$)



likelihood image



Dilated likelihood image



second measurments

robot best position($x=100, y=180, \theta=0^\circ$)

