

ECE 8843 Autonomous Control of Robotic Systems

Fall 2011 Homework Assignment 4

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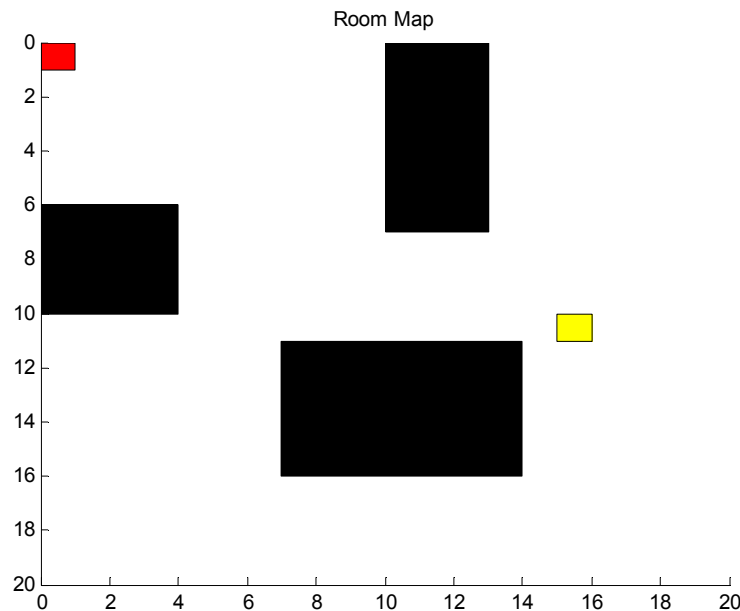
23rd November, 2011

Assignment

The assignment is to: 1) Discretize the space using either Visibility Graphs, Voronoi diagrams, or Probabilistic Roadmaps. 2) Apply a search method (e.g. A*, breadth-first, etc.) to find a set of waypoints that enable a robot to traverse from the start to the goal position.

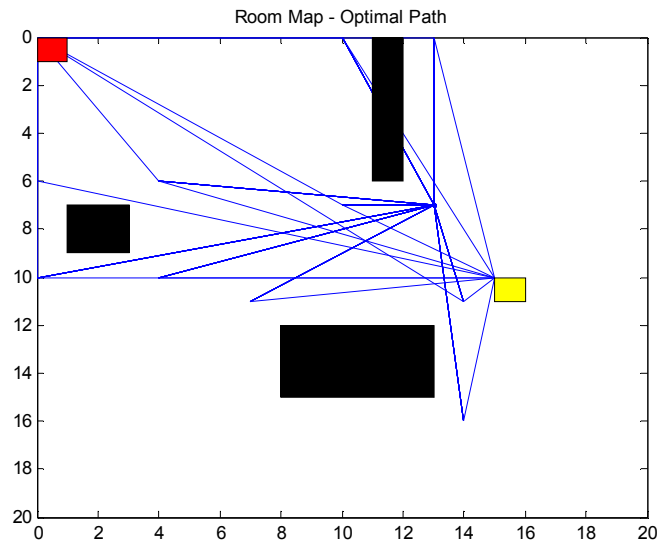
1 Solution

1.1 Grown Obstacles



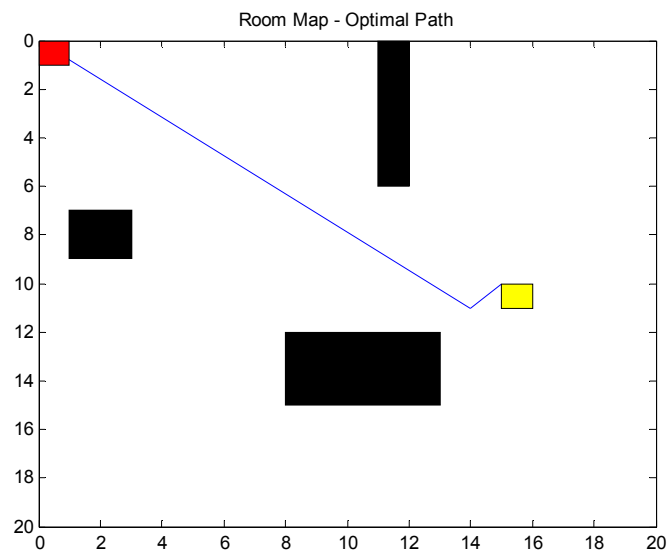
The three obstacles (from top to bottom), after being grown have dimensions of (3wx7h), (4wx4h), and (7wx5h).

1.2 Derived Roadmap



The roadmap method used to create the above map was Visibility Graphs.

1.3 Search Method Waypoints



The waypoints found by the optimized breadth search algorithm are (0,0) to (14,11) to (15,10) as seen in the above figure in blue.