Navigation: Bug algorithms

Bug 2

Bug2

Another, similar algorithm is called Bug2:

- Move toward the goal until reaching an obstacle.
- Follow this obstacle until it returns to the line connecting the start and goal positions.
  - If the robot can leave the obstacle toward the goal from this point, **and** it is closer to the goal than the hit point, then leave toward the goal.
  - Otherwise, continue around the obstacle.
- Repeat until the robot reaches the goal.

Analysis of Bug2

How long a path does Bug2 generate?

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How long a path does Bug2 generate?

- D: distance from start to goal
- M: number of obstacles
- p_i: perimeter of obstacle i
- n_i: number of intersection points between obstacle i and the start-to-goal line.

The path length is bounded by:

$$D + \frac{1}{2} \sum_{i=1}^{M} n_i p_i$$

A bad case for Bug 2