

Course > Quiz 2 > Quiz 2 > Motion...

## **Motion Planning**

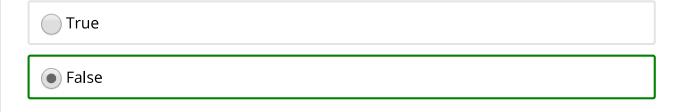
In the Motion Planning lectures we have discussed various local and global search algorithms. Below we will revisit some of these methods' properties in the form of multiple-choice questions and have a closer look at the implementation of Breadth First search.

NOTE: In the 'Collision Avoidance & Potential Fields' and 'Graph Search' section of the quiz, there is only 1 attempt allowed!

## Collision Avoidance & Potential Fields

3/3 points (graded)

Harmonic Potential Fields may have local minima in addition to a single global minimum.





**Explanation** 

Harmonic Potential Fields are the solution to the linear Laplace Equation. Hence only a single minimum can be attained.

The Dynamic Window Approach is guaranteed to find a solution path to the goal if one exists.

True			
<ul><li>False</li></ul>			



### **Explanation**

The DWA is a local method and may thus get stuck in local optima such as cul-de-sacs.

The Reciprocal Velocity Obstacle method can be directly applied to non-holonomic robots.





## **Explanation**

Input to the RVO method are 2D linear velocity. As such, non-holonomic constraints are not directly modeled.

Submit You hav

You have used 1 of 1 attempt

• Answers are displayed within the problem

# **Graph Search**

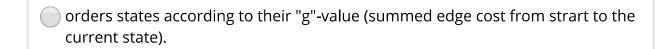
2/2 points (graded) Dijkstra's Search

- orders states according to a priority queue.
- finds an optimal solution on arbitrary graphs even if they contain negative edge weights.
- has a time complexity of O(|N|+|E|)



## **Explanation**

#### A\* Search



- has a better worst-case time complexity than Dijkstra.
- employs a heuristic -- which must be consistent for solution optimality to be guaranteed.



## **Explanation**

Submit

You have used 1 of 1 attempt

**1** Answers are displayed within the problem

# Implementation of Breadth First Search (External resource)

(15.0 / 15.0 points)