Unit 14 - Week 12

Course outline

How does an NPTEL online course work?
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Assignment 12

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-12-09, 23:59 IST.

Instructions: In the following questions, one or more choices may be correct. Select all that apply

1) Which of the following can be used for position tracking? ***1 point***

- [ ] Kalman Filters
- [ ] Extended Kalman Filters
- [ ] Particle Filters
- [ ] Binary Bayes Filter with static state

No, the answer is incorrect.
Score: 0
Accepted Answers:
Kalman Filters
Extended Kalman Filters
Particle Filters

2) Which of the following is most suited for global positioning? ***1 point***

- ( ) Kalman Filters
- ( ) Extended Kalman Filters
- ( ) Particle Filters
- ( ) None of the above

No, the answer is incorrect.
Score: 0
Accepted Answers:
Particle Filters

3) Assertion: Markov localization is an instance of a Bayes filter algorithm. ***1 point***

Reason: Markov localization assumes the availability of a map.

- ( ) Both Assertion and Reason are true, and Reason is correct explanation for Assertion
- ( ) Both Assertion and Reason are true, but Reason is not correct explanation for assertion
- ( ) Assertion is true and Reason is false
- ( ) Both Assertion and Reason are false

No, the answer is incorrect.
Score: 0
Accepted Answers:
Both Assertion and Reason are true, but Reason is not correct explanation for assertion

4) Which of the following are **true** about Breadth First Search ? ***1 point***

- [ ] It assumes that the edges are unweighted
- [ ] It is a complete algorithm
- [ ] It fails to return a path to the goal in case of infinite graphs
- [ ] It can repeatedly expand the same set of nodes

No, the answer is incorrect.
Score: 0
Accepted Answers:
It assumes that the edges are unweighted
It is a complete algorithm

5) **Statement**: Dijkstra's algorithm can handle arbitrary edge weights ***1 point***

- ( ) True
- ( ) False

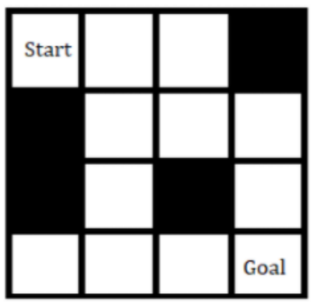
No, the answer is incorrect.
Score: 0
Accepted Answers:
False

6) Select all admissible heuristics from the options provided below. Using each of these admissible heuristics and the information provided in the table below, use the A* search algorithm to find a path from the start to goal state for the grid-world shown. You can take g(x) to be the number of steps taken to reach grid cell x from the start state, and assume that the robot can only move into adjacent cells (cells located above, below, to the left or to the right of the current position). ***4 points***

Heuristic options:

1. dist(start, x)
2. dist(start, x) - dist(start,goal)
3. dist(start, goal) - dist(start, x)

Note: dist(A,B) = Euclidean distance between A and B; x is a grid cell.



Euclidean distance from the start state to every grid cell

0	1	2	3
1	1.6	2.48	3.16
2	2.48	2.86	3.70
3	3.16	3.70	4.2

How many cells does the A* search algorithm visit to find the goal state? Select all answers that are possible, for all admissible heuristics. (Include the start and goal states in your counts)

- [ ] 8
- [ ] 9
- [ ] 10
- [ ] 11

No, the answer is incorrect.
Score: 0
Accepted Answers:
10
11