CS747 Assignment-3

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1 Task_1

1.1 Objective

We are given a grid on which there is a car which is randomly positioned. Our task is to navigate your 50 x 25 car out of a 700 x 700 square grid. It must exit onto the road whose entrance has its centre located at (350, 0). This grid is centred at the origin with the coordinate axes (screen size: 1000 x 1000). It is an episodic task that begins with your car initialised at a random position and orientation; the episode ends when you navigate out or bump into a wall.

1.2 Approach

This task has a direct approach. We first align our car towards the target spot. To do this we turn the car towards the target by steering it in anti-clockwise or clockwise direction (whichever is the nearest). Then we make the acceleration 5 to make the car go towards the target in a straight line.

2 Task_2

2.1 Objective

Task 2 is similar to Task 1 except the fact that there are 4 randomly located pits of mud (with a size of 100 x 100 each). Here, an episodic task that begins with your car initialised at a random position and orientation; the episode ends when you navigate out or bump into a wall or in a pit.

2.2 Approach

The first rule that the approach uses is that if there is no obstacle between the and the target at any time, then the car aligns to the target and moves straight towards it. This applies for every time period. Now for the part where there is an obstacle between the car and the target, we see if there is hindrance to the car in moving straight towards the x-axis. If there is, then it moves towards the positive x-axis until the overhead hindrance is cleared. Then it starts to move towards the x-axis. Now there will certainly be a time when the car does see the target to be clear of obstacles. Therefore, it moves straight towards it. Now if there is no hindrance towards the x-axis, then it moves straight towards it and again it will find an obstacle free path in the journey.

2.3 Difficulties

In calculating the obstacle-free path, we need make sure that the size of the car is also considered. Also the car ca rotate at random times. So keeping the car from touching the pit must also be ket in mind.