CIS603 Project 3: JiaoTong Tournament

Due: 19 Dec 2013
This is version 1.0 of this project description

This project builds on Projects 2a and 2b. In this project, you will design and implement your own algorithm for routing your agent through the JiaoTong world. Your algorithm will compete with the algorithms designed by the other teams in the class.

1 Deliverables for Project 3

For this project, you will turn in the following:

1. *Code that implements your algorithm.* You should create your own algorithm for determineing which routes to take in the world. Your code will connect to and communicate with the JiaoTongServer provided in Project 2b. In selecting your algorithm, you should reason about the ideas and principles we have discussed in class. You can use existing algorithms from the literature, but you have to justify why you used them, and you should customize them to work effectively in JiaoTong. Also, the code must be your own – you can't use someone else's code (that would be considered cheating).

   Note: Since we are skipping project 2c due to time constraints (coding and analyzing teachers, model-based reinforcement learning, and expert algorithms), I strongly suggest you consider using one of more of these algorithms in the algorithm you develop.

2. *A write-up describing and analyzing your algorithm.* Your write-up should both clearly overview your algorithm and clearly describe your algorithm in enough detail for someone else to implement it. You should motivate why you choose this algorithm. Your analysis should effectively highlight the strengths and weaknesses of your algorithm.

You will be graded on both the effectiveness of your algorithm and the quality of your write-up. However, even if your algorithm doesn't end up performing really well, you can still do very very well on the assignment, as long as you effectively motivate your algorithmic choices, explain your algorithm, and effectively evaluate its performance. You should show how successful your algorithm is in a number of scenarios, and you should evaluate why it is or is not successful.

2 Tournament Rules

Here are the initial rules of the tournament (I reserve the rights to add to or alter these rules to make the tournament better/more defined):

1. Each team will have 2 or 3 vehicles instantiated in each run of the tournament, depending on the number of teams we have.

2. The JiaoTongWorld can be tweaked slightly, but will have the same structure as you saw in Project 2. Changes in the locations of the nodes and the capacities of the links are possible. This information will be communicated to your client via the server (as before).

3. The reward structure of the game can be whatever I (the instructor) want it to be. The rewards/reward structure will be communicated to your client as it was in Project 2b. You must design your algorithm so that it takes into account the communicated rewards/reward structure.

4. You code is only allowed to communicate with the server. It cannot communicate with your other vehicles, or any other vehicles.

5. Games will be on the order of 250-500 minutes long.

6. The winner will be the algorithm with the highest average score over many different runs (averaged over all of your vehicles).

3 Due Dates – Firm deadlines

- Please submit your code no later than **8am on Dec 19**. We'll be verifying that we can get your code running on Dec 19, and we'll call you in for help if we have any problems.
- Your write-up should be submitted no later than **11:59pm on Dec 19**.