COMPUTER SCIENCE & ENGINEERING
TEXAS A&M UNIVERSITY

CSCE 689-601

Publish date Sep-21, 2018
Due date Oct-5, 2018

Home assignment #2

Run main.py, notice a single robot is delivering random pods to random packing stations. For each of the robot's tasks (go to pod, go to station, put pod back) the robot computes and executes the shortest path by running uniform cost search.
You can notice that each planning episode stops the program for a fraction of a second (watch the time step counter on the upper right corner).
Open main.py, change the scenario from "Warehouse-1.map" to "arena2-1.map". This is a much bigger map and UCS is very slow to plan. Your first task is to utilize the A* algorithm by setting an admissible heuristic value in the single-agent state.

1. Open "Planning->SingleAgentState.py", add an admissible heuristic for the single-agent case (see "# TODO: Your job - Set a better heuristic value.")

Open main.py, change the scenario field from "arena2-1.map" to "Warehouse-MAPF-2.map". This is a multiagent pathfinding problem with 2 agents. This instance is solved with UCS on the combined state-space. Notice that the multiagent planning is very slow to run. Your second task is to utilize the A* algorithm by setting an admissible heuristic value in the multiagent state.

2. Open "Planning->MultiagentState.py", add an admissible heuristic for the multiagent case (see "# TODO: Your job - Set a better heuristic value.")

Open main.py, change the scenario from "Warehouse-MAPF-2.map" to "lak303d-MAPF-2.map". This is a multiagent pathfinding problem with 2 agents on a large map. Multiagent A* is too slow to run on such a large map. Your third task is to implement the CBS algorithm.

3. Open "Planning->CBS_State.py", implement all required functions (you will need to add several more functions). Open "main.py", change "RobotNoCarry.ma_planner" to equal 'CBS' instead of 'maA*'. Try to run on the same scenario but with more agents "lak303d-MAPF-k.map". for k={2,3,4,5,10,20}.

When you are done, zip your project and send it to me via email to guni@tamu.edu
In the subject field write: [Assignment 2] – Final submission
In the body include the names of all team members. Don't forget to attach your zip file and send.

Good luck!