ME 538 Fall 2014

HW 1: Autonomous Agents Due 10/20/2014, 11:59 PM

Consider a 5x10 gridworld. The agent starts at a random location and has four actions (move in each of the four directions). There is a reward of 100 to catch T1, a target that starts at the red square and moves randomly by one square at each time step. In addition, there is reward of -2 for every time step the agent is in this gridworld.

- 1- Devise a learning algorithm (see note) that can catch T1. Clearly state all system parameters (inputs, states, outputs, training method, etc.)
- 2- Now, the target uses a different algorithm. Instead of moving randomly, it moves in a direction opposite the agent in each time step if possible, randomly if not. Can the agent still catch the target? Explain the behavior of the system.
- 3- Now, have 2 agents start at the same location and move in this grid. What behavior do you observe now? Do the agents benefit from each other? If so, is that intentional or incidental? Do they cooperate explicitly? Do they cooperate implicitly?

Note: The agent algorithm can be a neural network or a reinforcement learning algorithm. Clearly state the reward structure you select in either case.

