TDT4280 - Exercise 2

January 21, 2012

Practical Information

- Deadline: **Friday 18.02.2012, 23:55**
- Delivery:
  1. A pdf, ps or txt file with answers to the theoretical questions and statistics (no Word files).
  2. A zip-file named YourLastName(s).zip with all the .java and .class for this exercise. The package name you use for your robot in robocode must be the same as the name of this zip file!
- You can deliver in pairs.
- You can write in english or norwegian.

For theoretical questions provide profound justification of your answers supported by theory presented during the lectures or from the textbook.

1 Planning

Theoretical Questions

Read about planning in Wooldridge (chapter 4).

1. Think of at least three goals and corresponding plans for a robocode agent. Explain these plans, and how might an agent decide what plan to follow.
2. Discuss overcommitting (i.e. sticking to a certain plan for too long). When, why and how this problem can be solved?

2 Communication

Theoretical Questions

Read about communication in Wooldridge (chapter 7).

1. Describe in your own words the FIPA agent communication language, and your choice of performatives used in the programming exercise.
2. Explain why ontologies are useful.

Programming in Robocode

Create 8 agents of the same class, where upon initialization each agent is randomly assigned to one of two types. The agents are supposed to communicate to each other what type they are, so they will know which agents are friends and which are foes. Agents on the same team will only attack agents on the other team. Indicate which type the agents are by setting the color accordingly. Note that they all have to be assigned to the same team according to robocode. In addition you will need a "dummy-team" since robocode ends the round when there is only one team left.

The communication shall follow the FIPA ACL standard (Wooldridge, chapter 7.2.2), which you must implement. Additionally, you must implement the parsing of messages. You must choose which performatives are suited to the communication task at hand. It makes no sense to attach statistics on this assignment, since all the agents are the same type. The main point is learning about the FIPA ACL standard.

3 Working Together and Negotiation

Theoretical Questions

Read about negotiation in Wooldridge (chapters 8, 11 and 14).

1. Explain the FIPA Contract Net Protocol (see chapter 8.2.1).
2. Read the programming task below and describe your agent's strategy for negotiating with other agents.
3. Elaborate on the advantages and disadvantages of the different auction types mentioned in chapter 14.2.

Programming in Robocode

In this task, you need to implement two types of agents:

Master agent: this agent has a lot of money, but it cannot fight. Whenever it finds an enemy, it will use its money to hire one or two soldier agents to fight against the enemy (at most two soldier agents can fight against the enemy simultaneously).

Soldier agent: this agent is able to fight, but it only fights against an enemy when it is hired (paid) to fight against it.

Contract Net (see chapter 8.2.1 in Wooldridge) should be implemented for the master agent to select solider agents to hire (for example, choosing the cheapest). When a solider agent receives an advertisement, it can generate a random price and puts the price into a bid. In your implementation, you need to show the different status of the

soldier (hired or not hired through changing its colour). The communication mechanism from part 2 should be used to support the communication among agents. In the battlefield (each round), there is a master agent, and 5 soldier agents waiting to be hired, and Wall and Crazy as the possible enemies. In the 10 round battles, your master agent should live longer than both Wall and Crazy.