UNIVERSITEIT VAN AMSTERDAM

Assignment 1
Independent Agents and Multi-Agent Coordination

Robrecht JURRIAANS
5887380

Sander LATOUR
5743044

Hessel MOLEN
5619785

September 19, 2011

1 Introduction

In this paper we will solve a predator-prey game within the PURSUIT-domain[1] where a group of predators have to hunt down a number of prey. The world consists of an nxm grid in which the agents can move either to the four orthogonal squares or to all eight surrounding squares. The world used here is a toroidal world in which the agents can move of the grid and emerge on the other side of the grid as seen in figure 1. The initial condition that needs to be satisfied in order for a predator to capture a prey is that the predator moves to the cell in which the prey is located.

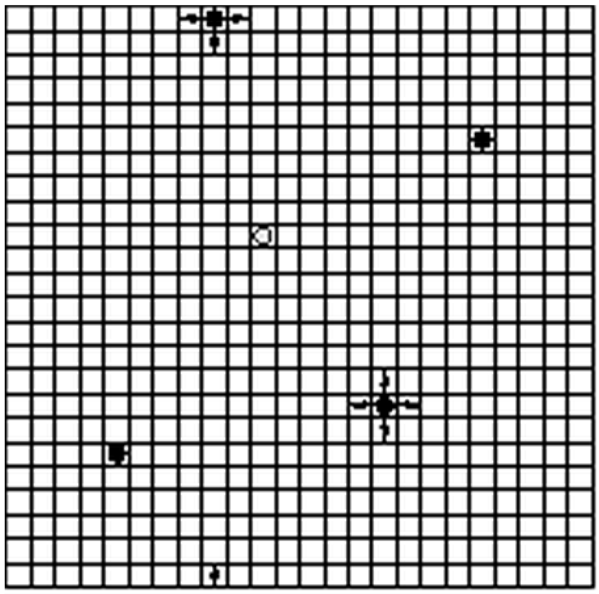

Figure 1: Orthogonal movement in a toroidal world

Agent Behaviour The prey can either move to any unoccupied cell of the four cells located orthogonally around the prey with a probability of 0.8 or stand still with a probability of 0.2. The initial behaviour of the predator is also random and does not use the information retrieved by the predators sensors.

Overview of Paper In section 2 we will discuss both rational independent agents and basic coordination between multiple agents. In section 3 we will discuss how coordination can be applied to improve efficiency in the predator-prey task. We will then describe our implementation in section 4. Finally we will show the benchmark of our implementation in section 5 and draw conclusions from the results in section 6.

[1] http://www.cs.cmu.edu/afs/cs/usr/pstone/public/papers/97MAS-survey/node8.html

2 Theory

[1]

3 Application

4 Implementation

5 Experiments and results

6 Conclusion

References

[1] Nikos Vlassis. A concise introduction to multiagent systems and distributed. In *Artificial Intelligence. Synthesis Lectures on Artificial Intelligence and Machine Learning. Morgan & Claypool Publishers*, 2007.