

Multiagent Simulation

Practical Work

Part 1: Development Platform Configuration

- 1) Download TurtleKit version 2.4.9 at <http://www.madkit.org/turtlekit>
- 2) Look at the API :
 - a. Madkit : <http://www.madkit.org/api/>: AbstractAgent, Message, ActMessage, ACLMessage
 - b. Turtlekit : Tk2/doc/index.html: Turtle
- 3) Follow the instruction in the file README.txt (in the directory of the project Tk2) to configure the running configuration.
- 4) Uncomment the hunt demo and comment the Termites Demo.
- 5) Run the project.

Part 2: Simulation Configuration

- 1) Creation of a new project
 - a. Create a new package mySimulation
 - b. Copy the content of the hunt package; rename (mySimulation.xml) and adapt the configuration file in the new project
 - c. reference the new project in Simulations.cfg
- 2) Modify the configuration file mySimulation.xml in order to have 1 prey and 5 predators
- 3) Modify the initial color of the predator to green and the prey behavior in order that a prey that is closed to a predator changes its color to red.
- 4) Modify the behavior of the predator: when he perceives a prey he sends an inform message to other predators. The recipients change their color to yellow

Instructions to send a message:

```
ACLMessage m = new ACLMessage("INFORM", getAddress()+ " saw a prey");  
broadcastMessage("Turtlekit", "Tk2 Simu", "predator", m);
```

Instruction to read a message in the mailbox

```
Message m = this.nextMessage();
```

Part 3: Predator Strategy

- 1) Propose a coordination protocol between predators to improve their behavior
- 2) Discuss your proposal following the number of predators and preys

Remarks:

A Hashtable is associated to a message:

setField (Key as a String ,Value as an Object) to add an element
getFieldValue(Key) to retrieve the value (as an Object) of the key.

A Turtle computes a direction with the function towards(double a, double b) which returns direction to the cell (a,b).