

# TDT4280 - Exercise 1

January 21, 2012

## Practical Information

- Deadline: **Friday 04.02.2012, 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 Purely Reactive Agents

### Theoretical Questions

Read about purely reactive agents in Wooldridge (chapter 2).

1. Describe the environment in Robocode.
2. Discuss the limitations versus the advantages of purely reactive agents.

### Programming in Robocode

Download and install RoboCode from <http://robocode.sourceforge.net>

Implement at least one type of **purely reactive** agent. Your agent should be able to beat RamFire at least 50% of the time in a one-on-one battle. Include statistics from a 10 round battle with your agents showing how it compares to RamFire.

## **2 Agents with State and Utility**

### **Theoretical Questions**

Read about agents with state and utility functions in Wooldridge (chapter 2).

1. Discuss the advantages and limitations of agents with state and utility versus purely reactive agents.
2. Elaborate on how much work it was to program a state-utility agent versus a reactive agent that could beat RamFire.
3. Describe and justify your utility functions.

### **Programming in Robocode**

Implement at least one agent who makes use of the terms state and utility. You should implement utility functions which compute the utility for taking different actions, and choosing the one with the highest value. Your agent must now have state (i.e. it is ok to use instance variables), the state could influence your utility functions.

Your agent must beat RamFire and Crazy at least 50% of the time, in a one-on-one battle.

Include statistics from a 10 round battle with your agent showing how it compares to RamFire and Crazy.