Foundations of Artificial Intelligence

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Exercise Sheet 1

Due: Wednesday, April 24, 2013

Exercise 1.1 (Potentials and Limits of AI)
Examine the AI literature or the Internet to discover to what extent the following tasks can currently be solved by computers/robots:

(a) Playing the board games Checkers and Go.

(b) Performing real-time natural language processing.

(c) Autonomy of unmanned ground and aerial vehicles (UGVs and UAVs).

(d) Carrying heavy loads in rough terrain.

(e) Automatic face recognition.

(f) Playing first-person shooters (e.g. Unreal Tournament) like a human.

Write down your findings in 2–3 sentences each.

Exercise 1.2 (Performance and Utility)

(a) What is the difference between a performance measure and a utility function?

(b) Describe the relation between the performance measure and the utility function for a learning agent.

Exercise 1.3 (Rational Agents)

(a) Write down a PEAS[1]-Description for each of the following agents:

  (i) Performing high jumps
  (ii) Playing Poker
  (iii) Playing Conway's Game of Life

(b) Characterize the environments of the agents in (a) according to the following criteria:

- fully observable vs. partially observable
- deterministic vs. stochastic
- static vs. dynamic
- discrete vs. continuous

The exercise sheets may and should be worked on in groups of three (3) students. Please write all your names and the number of your exercise group on your solution.

[1] **P**erformance **E**nvironment **A**ctuators **S**ensors