Foundations of Artificial Intelligence

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Exercise Sheet 1

Due: Friday, May 2, 2008

Exercise 1.1 (What is AI?)

(a) Characterize the following definitions with respect to the four categories presented in the lecture.

- "A collection of algorithms that are computationally tractable, adequate approximations of intractably specified problems." (Partridge, 1991)
- "The enterprise of constructing a physical symbol system that can reliably pass the Turing Test." (Ginsberg, 1993)
- "The field of computer science that studies how machines can be made to act intelligently." (Jackson, 1986)

(b) "Surely computers cannot be intelligent—they can do only what their programmers tell them."

Discuss whether the latter statement is true, and whether it implies the former.

Exercise 1.2 (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 translations of spoken English into spoken German.

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

(d) Carrying heavy loads in rough terrain.

(e) Automatic face recognition.

Write down your findings in 2–3 sentences each.

Exercise 1.3 (AI and Complexity)

It is well-known that there are classes of problems (such as NP) which are infeasible for a computer. Does this mean that Artificial Intelligence is impossible? Explain your answer.

The exercise sheets may and should be worked on in groups of three (3) students. Please fill the cover sheet[1] and attach it to your solution.

[1] `http://www.informatik.uni-freiburg.de/~ki/teaching/ss08/gki/coverSheet-english.pdf`