

EXAM IN SIF8072 DISTRIBUTED ARTIFICIAL INTELLIGENCE AND INTELLIGENT AGENTS

WEDNESDAY 18 DECEMBER 2000, 9AM - 1PM

1 Problem I. What is an agent? (10%)

1. If traffic lights (together with their control systems) are to be considered as intelligent agents, which of agent's properties should they employ? Illustrate your answer by examples.

2 Problem II. Theory (10% + 10%)

1. Are Modal Logics more suitable than Classical Logic for modeling intelligent agents? Explain your answer.
2. Formalize in the logic of knowledge the following problem:
"Agent A wants to find out cost of football tickets. Agent A doesn't know the cost but Agent A knows that Agent B exists. Agent B doesn't know the cost either but Agent B knows that Agent C exists. Agent C knows the cost".

3 Problem III. Negotiation (5% + 5%)

1. What are the basic differences in applying negotiation strategies for cooperative and self-interested Multi-Agent Systems?
2. Insincerity of the auctioneer (even if s/he doesn't disclose bids to others) may be a problem in the Vickrey auction. Illustrate this by an example.

4 Problem IV. Communication (5% + 10%)

1. Give basic ideas of the agent communication languages KQML and FIPA. What do they have in common and what are basic differences between them?

2. List the sequence of KQML or FIPA(it is your choice) performatives that must be generated by Agent A, Agent B and Agent C for solving the problem described in the problem II, item 2.

5 Problem V. Architectures for agents and Multi-Agent System (25%)

1. Propose a general architecture for a Multi-Agent System which implements a simple virtual shop on the Internet. In particular, give the basic types of agents and possible types of coordination, communication and negotiation in such a system.

6 Problem VI. Coordination (10%)

1. Describe the basic coordination techniques. Compare these techniques and give examples of situations where each of the techniques can work better than others.

7 Problem VII. Mobile agents (10%)

1. What are the main security issues for mobile agent system?