

Course wrap up

July 26, 2005

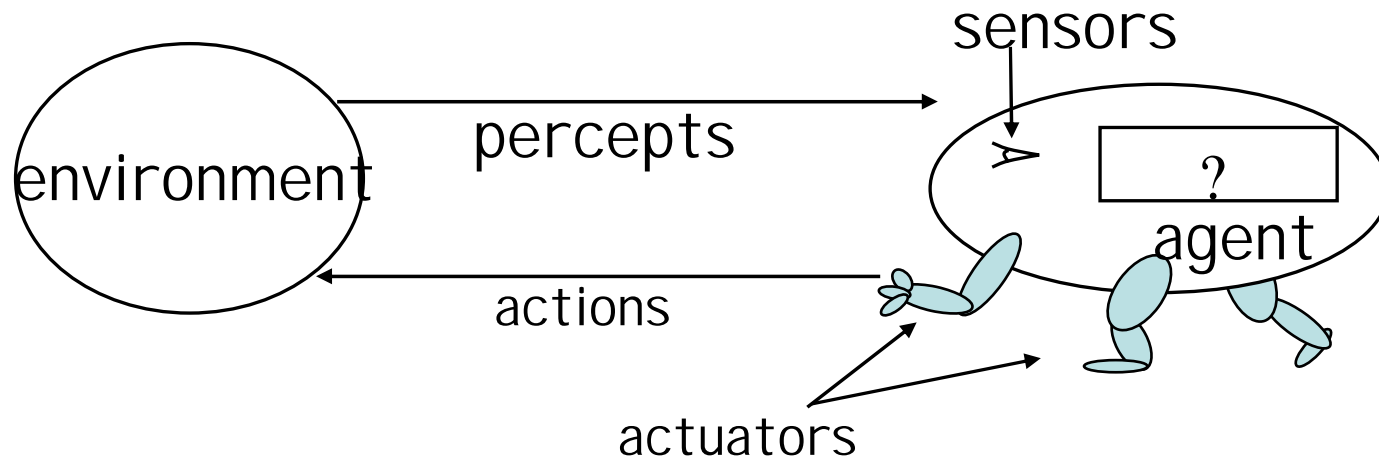
CS 486/686

University of Waterloo

Outline

- Course wrap up
- Final exam info
- Other AI courses
- AI jobs
- AI research

Agents and Environments



Agents include humans, robots, softbots, thermostats...

The **agent function** maps percepts to actions $f:P^* \rightarrow A$

The **agent program** runs on the physical architecture to produce f

Rational Agents

- Recall: A rational agent “does the right thing”
- Performance measure – success criteria
 - Evaluates a sequence of environment states
- A **rational agent** chooses whichever action maximizes the **expected** value of its performance measure **given the percept sequence to date**
 - Need to know performance measure, environment, possible actions, percept sequence
- Rationality \neq Omniscience, Perfection, Success
- Rationality \rightarrow exploration, learning, autonomy

Bounded Rationality

- What if the best strategy given past percepts cannot be implemented with today's computers?
- We have seen many theories for rational agents but what if those theories are intractable?
- **Bounded rationality**: find best **implementable** strategy given past percepts

Other AI courses

- CS498: Machine Learning – Statistical and Computational Foundations
- CS498: Image and vision computing
- CS785: Intelligent Computer Interaction
- CS886: Topics in AI : Reasoning under Uncertainty
- CS886: Topics in AI : Knowledge representation

CS498: Machine Learning – Statistical and Computational Foundations

- Instructor: Shai Ben David
- Term: Winter 2006
- Objectives:
 - The course is aimed to familiarize the students with the basic theoretical tools and issues underlying some of the most useful machine learning techniques. The theory of machine learning draws from several established mathematical areas including statistics, geometry, combinatorics, and computational complexity.

CS785 Intelligent Computer Interaction

- Instructor: Robin Cohen
- Term: Fall 2005 or Spring 2006
- Topics:
 - multiagent systems,
 - intelligent tutoring systems and knowledge-based systems,
 - datamining,
 - user modeling,
 - natural language generation and dialogue,
 - plan recognition

CS886: Topics in AI :

Reasoning under Uncertainty

- Instructor: Pascal Poupart
- Term: Fall 2005
- Objectives:
 - This course will focus on the principles of probabilistic reasoning and sequential decision making for a wide range of settings including adaptive and multi-agent systems. The modeling techniques that will be covered are quite versatile and can be used to tackle a wide range of problems in many fields including robotics (e.g., mobile robot navigation, control), computer systems (e.g., autonomic computing, query optimization), human-computer interaction (e.g., spoken dialog systems, user modeling), bioinformatics (e.g., gene sequencing, design of experiments), operations research (e.g., resource allocation, maintenance scheduling, planning), etc. Hence, the course should be of interest to a wide audience beyond artificial intelligence.

CS886: Topics in AI : Knowledge Representation

- Instructor: Chrysanne DiMarco
- Term: Spring 2006
- Topics: TBA

AI research group

- Web: ai.uwaterloo.ca
- Professors:
 - Shai Ben David (learning theory)
 - Chrysanne DiMarco (natural language processing)
 - Peter Van Beek (constraint programming)
 - Robin Cohen (multi-agent systems, user modeling)
 - Pascal Poupart (reasoning under uncertainty, machine learning)
 - Kate Larson (game theory, mechanism design)
 - Richard Mann (computational vision)

AI jobs

- Very few “AI companies”
- AI tends to be **embedded** in many applications
- Many companies have AI R&D groups
 - Intel, Microsoft, IBM, Google, NEC, Yahoo, HP
- AI is a growing industry
- Has the potential to revolutionize the computer industry!