Chapter 2 Intelligent Agents

CS4811 - Artificial Intelligence

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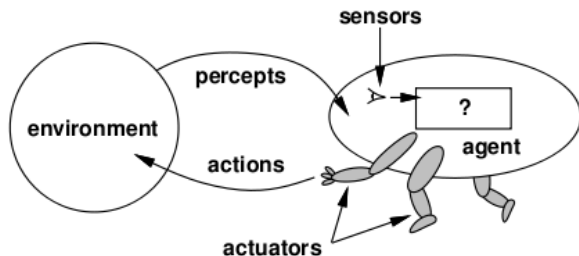Department of Computer Science
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Outline

Agents and environments


- Agents include humans, robots, softbots, thermostats, etc.
- The agent function maps percept histories to actions:
  $f : P^* \to A$
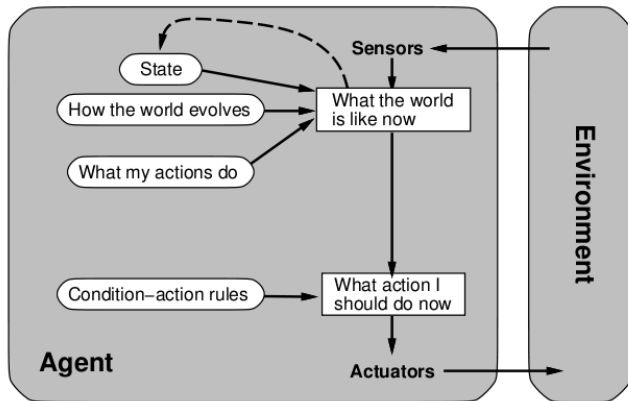- The agent program runs on the physical architecture to produce f

Agent types

- Four basic types in order of increasing generality
  - simple reflex agents
  - reflex agents with state
  - goal-based agents
  - utility-based agents
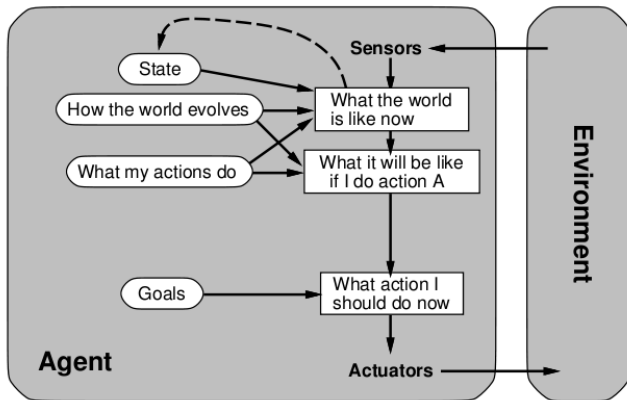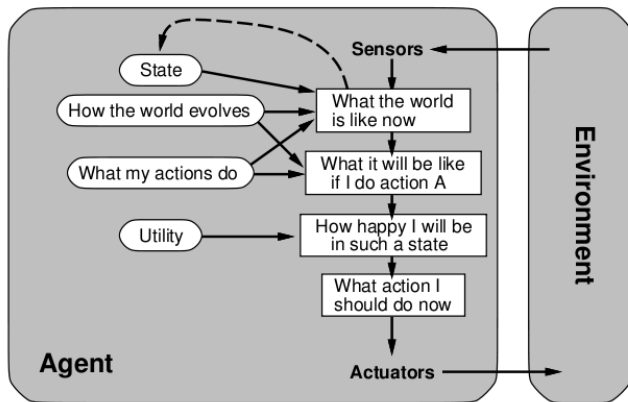- All of these can be turned into learning agents

Simple reflex agents
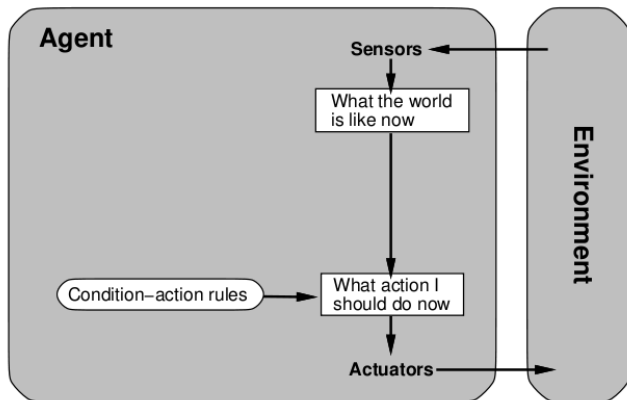
Reflex agents with state

Goal-based agents
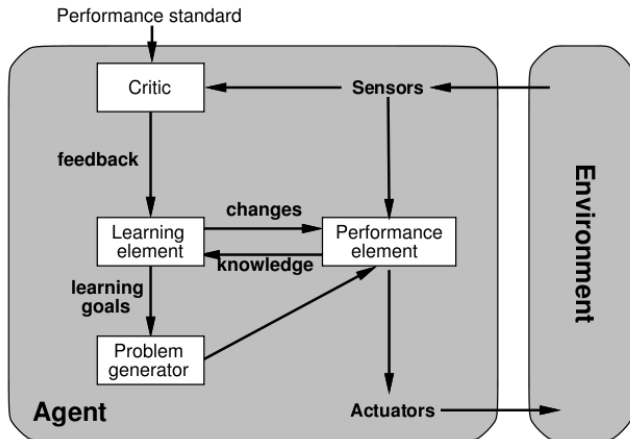
Utility-based agents

Learning agents

Summary

- Agents interact with environments through actuators and sensors
- The agent function describes what the agent does in all circumstances
- The performance measure evaluates the environment sequence
- A perfectly rational agent maximizes expected performance
- Agent programs implement (some) agent functions
- Task environments are categorized along several dimensions: observable?, deterministic?, episodic?, static?, discrete?, single-agent?
- Several basic agent architectures exist: reflex, reflex with state, goal-based, utility-based

Sources for the slides

- AIMA textbook (3rd edition)
- AIMA slides (http://aima.cs.berkeley.edu/)