

# Intelligent Agents

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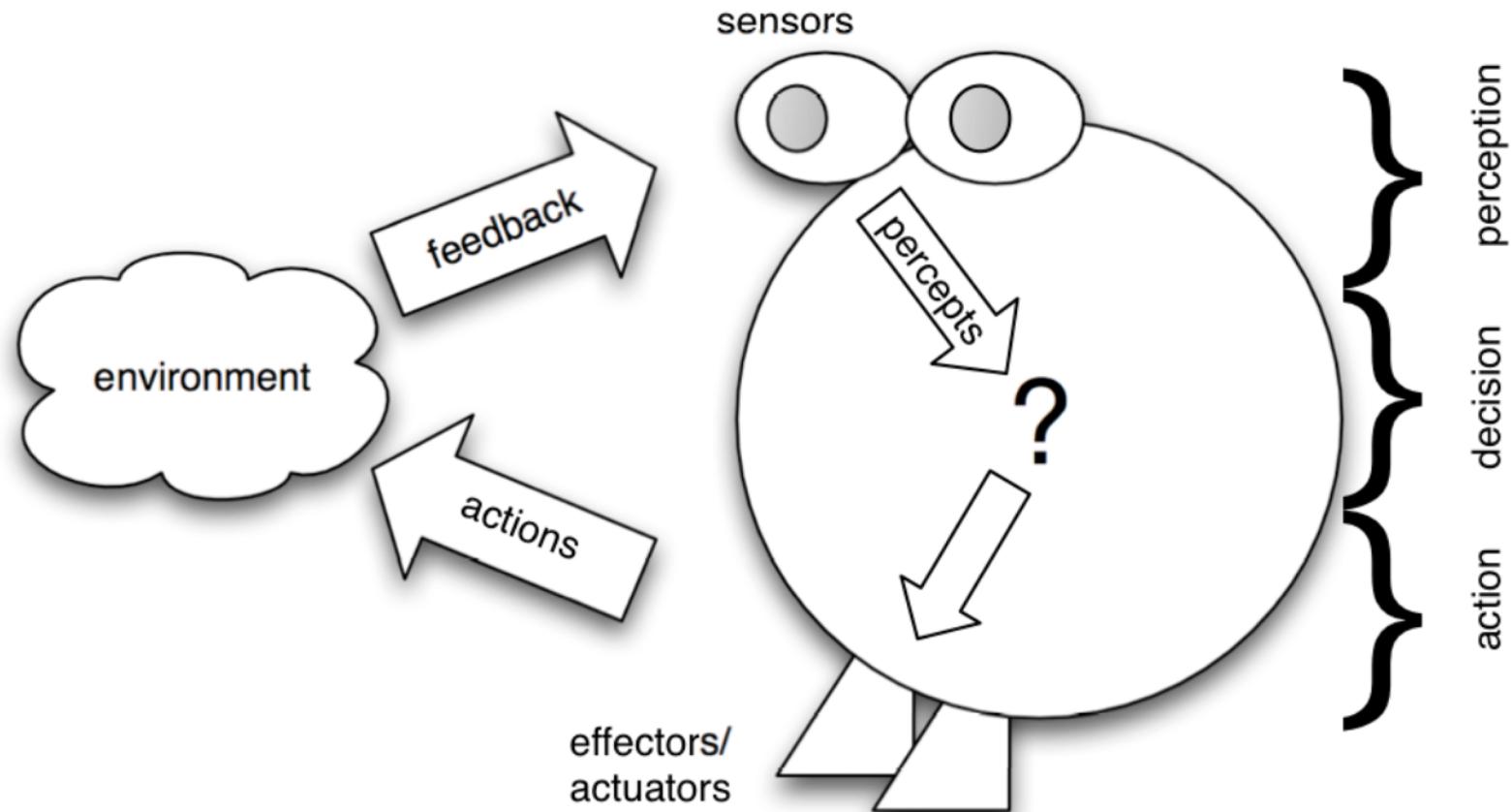
- Agent and Environment
- Properties of Intelligent Agents
  - Reactivity
  - Proactivity
  - Social ability

# Revisiting: What is an Agent?

- Important point: An agent is *autonomous*
  - capable of deciding for itself and performing independent actions
- Definition
  - An agent is a computer system capable of performing autonomous action in some environment, in order to achieve delegated goals

- We think of agents as situated in an environment
  - Engage in a close-coupled loop
  - Continually interact with the environment
- sense – decide – act – sense – decide ...

# Agent and Environment



# Simple (Not Interesting) Agents

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- Thermostat
  - delegated goal is to maintain room temperature
  - actions are to switch heating ON and OFF
- Unix biff program
  - delegated goal is to monitor for incoming email and flag it
  - actions are GUI actions

These examples satisfy the definition of an agent, but the decision making they are involved in is trivial

# Properties of Intelligent Agents

- Intelligent agents exhibit three types of behaviours
  - Reactive
  - Proactive
  - Social

- Ideal scenario: environment is fixed
  - A program can just execute blindly
- Reality
  - Environment is dynamic
- A reactive system is one that maintains an ongoing interaction with its environment and responds to changes that occur in the environment
  - Response needs to be in-time for it to be useful

## Reactivity: Stimulus follows a response

- Smart Home
  - Turn on the yard lights when motion is detected
    - Racoons
  - Turn on the bedroom lights when someone enters
    - Pet moving around at night
- Thermostat

- Reacting to environment is easy
  - Stimulus -> Response lookup table
  - Not the most effective behaviour
- Proactivity is about exhibiting a goal directed behaviour
  - Systematically working to achieve goal
  - Anticipate and take initiative

- Real world is a multiagent environment
  - We cannot go around attempting to achieve goals without taking others in the account
- Social ability in agents is the ability to interact with other agents (and humans) via a communication language
  - Coordinate
  - Negotiate
  - Cooperate

# Sample Questions

# Example Questions

- Is a simple thermostat worthy of being called as an agent? Why? [1 marks]
- Describe the sense-decide-act loop? [2 marks]
- What is a reactive agent? [1 mark]
- Social ability in an intelligent agent is the ability to interact with other agents. List and explain the key aspects of social interactions. [3 marks]
- An agent is defined using the properties it exhibits. List and describe the three properties you associate with an intelligent agent. [5 marks]

Thank you