

- What is artificial intelligence?
- Agents acting in an environment

Learning objectives: at the end of the class, you should be able to

- describe what an intelligent agent is
- identify the goals of Artificial Intelligence
- classify the inputs and the outputs of various agents

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 - ▶ it makes appropriate choices given perceptual and computational limitations

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Can a book or article *do* things?
Convince? Argue? Inspire? Cause people to act differently?

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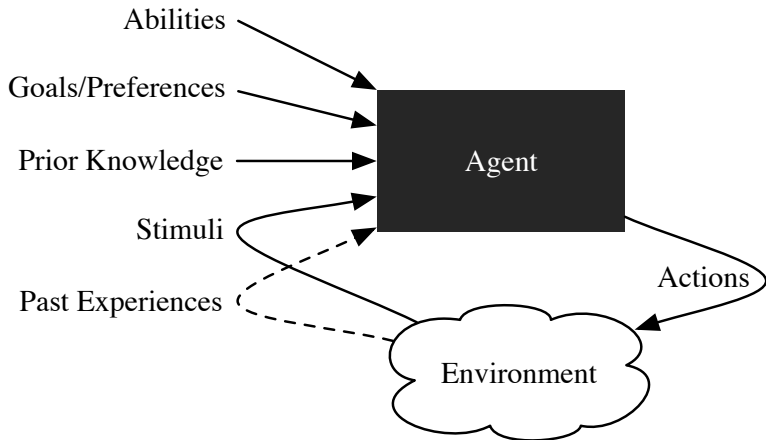
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- **Engineering goal:** design useful, intelligent artifacts.
- Analogy between studying flying machines and thinking machines.

Agents acting in an environment: inputs and output



Inputs to an agent

- **Abilities** — the set of possible actions it can perform
- **Goals/Preferences** — what it wants, its desires, its values,...
- **Prior Knowledge** — what it comes into being knowing, what it doesn't get from experience,...
- **History** of stimuli
 - ▶ (current) **stimuli** — what it receives from environment now (observations, percepts)
 - ▶ **past experiences** — what it has received in the past

Example agent: autonomous car

- abilities:

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- **stimuli:** vision, laser, GPS, voice commands ...
- **past experiences:** how braking and steering affects direction and speed...

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- **past experiences:** effect of steering, slipperiness, how people move, . . .

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- **stimuli:** test results, facial expressions, errors, focus, . . .
- **past experiences:** prior test results, effects of teaching strategies, . . .

Example agent: thermostat for heater

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- **prior knowledge:** 24 hour cycle, weekends
- **stimuli:** temperature, set temperature, who is home, outside temperature
- **past experiences:** when people come and go, who likes what temperature

Example agent: medical doctor

- abilities:
- goals/preferences
- prior knowledge:
- stimuli:
- past experiences:

Example agent: Apple Inc.

- abilities:
- goals/preferences
- prior knowledge:
- stimuli:
- past experiences:

Other Agents

- user interface
 - bee
 - smart home
 - ...
-
- abilities:
 - goals/preferences
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Example agent:

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Clicker Question

The **abilities** of an agent are:

- A What functions the agent is able to compute
- B The set of actions available to the agent
- C Whether it can play tennis
- D What the agent wants
- E What it has learned from experience

An agent that does not learn does not need:

- A Abilities
- B Goals/Preferences
- C Prior Knowledge
- D Observations
- E Past experiences

Prior knowledge is not:

- A what is programmed into an agent
- B what an agent gets from experience
- C what biology has evolved for animals when they are born
- D required for both artificial and natural agents
- E what psychologists call “nature” in the nature-nurture debate

What is the role of data in the applications presented:

- A It was all that was needed to get the application to work
- B It was ignored in the applications presented
- C All of the applications required data sets of the size of the set of all of the photos that are posted on the web
- D Only expensive proprietary data is useful
- E It was used in many of the applications to improve performance

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