What is Artificial Intelligence (AI)?

"[The automation of] activities that we associate with human thinking, activities such as decision-making, problem solving, learning . . ." **(Bellman, 1978)**	**"The study of mental faculties through the use of computational models"** **(Charniak and McDermott, 1985)**
"The study of how to make computers do things at which, at the moment, people are better" **(Rich and Knight, 1991)**	**"The branch of computer science that is concerned with the automation of intelligent behavior"** **(Luger and Stubblefield, 1993)**

What is Artificial Intelligence (AI)?

Views of AI fall into four categories

Thinking humanly	**Thinking rationally**
Acting humanly	**Acting rationally**

Most AI researchers in Computer Science go for acting rationally

Acting humanly: The Turing test

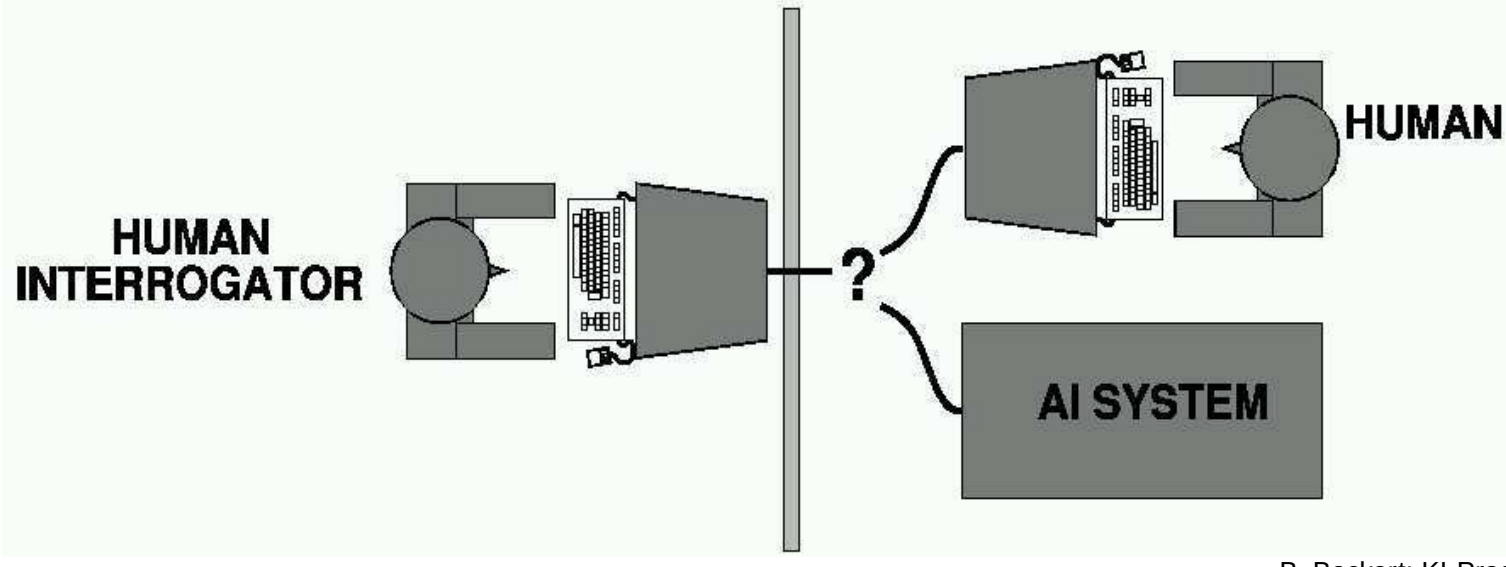
Turing (1950): *Computing machinery and intelligence*

- **“Can machines think?’**

  “Can machines behave intelligently?”

- **Operational test for intelligent behavior: the Imitation Game**

Classical Turing test



Acting humanly: The Turing test

Total Turing test

Includes physical interactions with environment

- **speech recognition**
- **computer vision**
- **robotics**

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Problem of Turing test

Turing test is

- **not reproducible**
- **not constructive**
- **not amenable to mathematical analysis**

Acting humanly: The Turing test

Turing's predictions

- **Predicted that by 2000, a machine might have a 30% chance of fooling a lay person for 5 minutes**
- **Anticipated all major arguments against AI in following 50 years**
- **Suggested major components of AI: knowledge representation, reasoning, language understanding, learning**

Turing's paper online available at

`http://www.abelard.org/turpap/turpap.htm`

The Turing Test and Subfields of AI

- **Knowledge Representation**
- **Searching**
- **Automated Reasoning (Deduction)**
- **Machine Learning**
- **Natural Language Processing**
- **Computer Vision**
- **Robotics**

Turing's and other Tests

Loebner Prize

A restricted Turing test, held annually in the form of a competition

> **The Loebner Prize is awarded annually for the computer program that best emulates natural human behavior. During the contest, a panel of independent judges attempts to determine whether the responses on a computer terminal are being produced by a computer or a person, along the lines of the Turing Test. The designers of the best program each year win a cash award and a medal. If a program passes the test in all its particulars, then the entire fund will be paid to the program's designer and the fund abolished.**

`http://www.loebner.net/Prizef/loebner-prize.html`

Acting rationally

Rational behavior

Doing the right thing

The right thing

That which is expected to maximize goal achievement, given the available information

(Doesn't necessarily involve thinking—e.g., blinking reflex)

Aristotle: *Nicomachean Ethics*

Every art and every inquiry, and similarly every action and pursuit, is thought to aim at some good

Acting rationally

A thoroughly pragmatic point of view

- **In practical terms, so far the most fruitful road taken by AI**
- **Completely misses the perhaps most central aspect of being human:**

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Consciousness

Philosophical / theological questions

Can machines have

- **minds?**
- **souls?**
- **consciousness?**

Do sufficiently intelligent machines (automatically) have

- **minds?**
- **souls?**
- **consciousness?**

Two theories

Dualism: **Body and soul/mind are separate things**

Materialism: **There is no immaterial soul/mind**
(J. R. Searle: “Brains cause minds”)