

Artificial Intelligence
[week #1]
Introduction

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Background

- *Homo sapiens* → man the wise : intelligence so important to us → try to understand how we think
- AI → not only to understand → to build intelligence entities
- AI → “field I would most like to be in”

AI Definitions

- To understand vs To build
- Human intelligence vs Ideal intelligence
 - ideal → rational → do the right thing
- Reasoning (thinking) vs Behavior (acting)

AI Definitions

<p>Thinking Humanly</p> <p>“The exciting new effort to make computers think . . . <i>machines with minds</i>, in the full and literal sense.” (Haugeland, 1985)</p> <p>“[The automation of] activities that we associate with human thinking, activities such as decision-making, problem solving, learning . . .” (Bellman, 1978)</p>	<p>Thinking Rationally</p> <p>“The study of mental faculties through the use of computational models.” (Charniak and McDermott, 1985)</p> <p>“The study of the computations that make it possible to perceive, reason, and act.” (Winston, 1992)</p>
<p>Acting Humanly</p> <p>“The art of creating machines that perform functions that require intelligence when performed by people.” (Kurzweil, 1990)</p> <p>“The study of how to make computers do things at which, at the moment, people are better.” (Rich and Knight, 1991)</p>	<p>Acting Rationally</p> <p>“Computational Intelligence is the study of the design of intelligent agents.” (Poole <i>et al.</i>, 1998)</p> <p>“AI . . . is concerned with intelligent behavior in artifacts.” (Nilsson, 1998)</p>

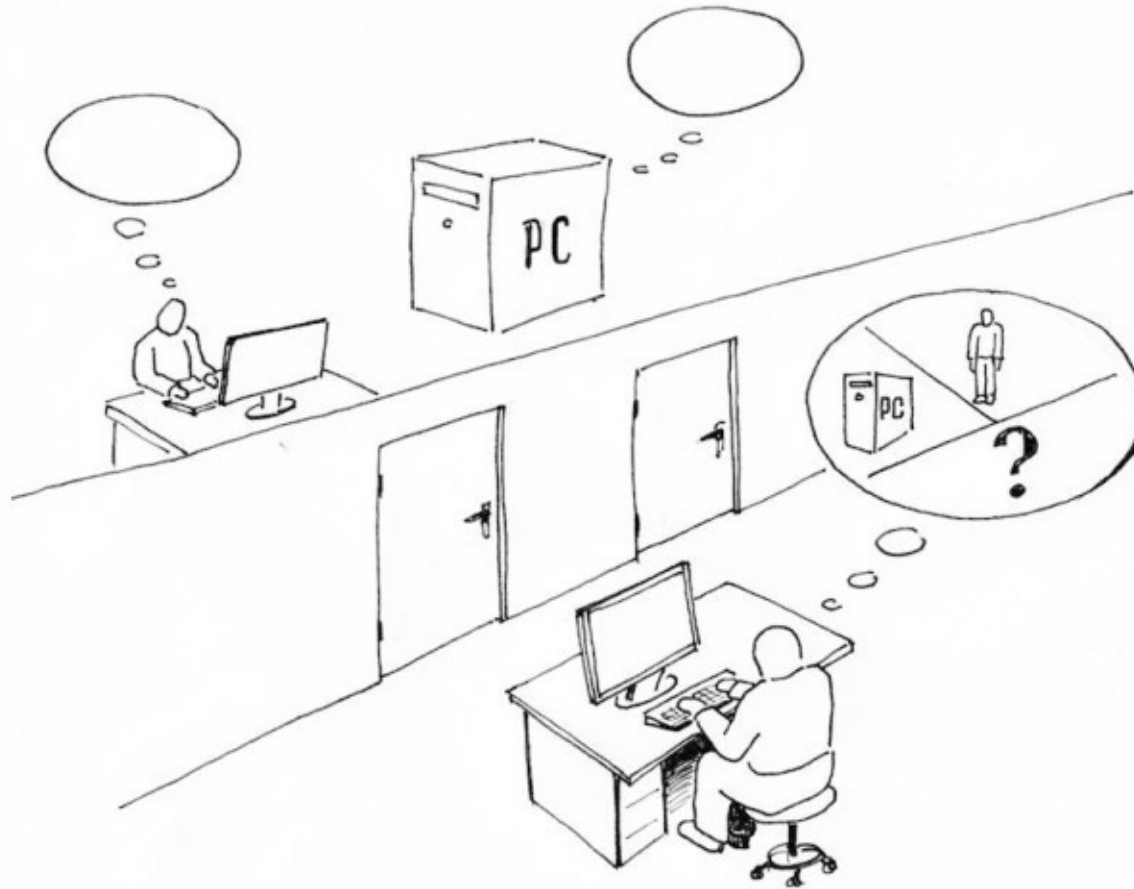
Thinking Humanly

- The cognitive modeling approach
- How human think?
- Need to get inside the actual workings of human minds
 - introspection
 - psychological experiments
 - brain imaging

Acting humanly

- The turing test approach (1950): designed to provide a satisfactory operational definition of intelligence
- “Can machines think?” → “Can machines behave like humans?”
- To fly, not to imitate bird

Acting humanly



Thinking Rationally

- Aristotle → “right thinking”
- Syllogisms: yielded correct conclusions when given correct premises
 - Socrates is a man
 - All men are mortal
 - Socrates is mortal

Thinking Rationally

- Two main obstacles:
 - Not easy to take informal knowledge → formal notation
 - Computational cost

Acting rationally

- Agent: something that act
- Computer Agent:
 - operate autonomously
 - perceive environment
 - adapt to change
 - pursue goal
- Rational agent: to achieve the best outcome