What is AI, Intelligent Agents

Ref: Thorsten Joachims, Cornell University

What is “Intelligence”

- Intelligence:
  - the capacity to learn and solve problems''(Webster dictionary)
  - the ability to think and act rationally

What is involved in Intelligence

- Ability to interact with the real world
  - to perceive, understand, and act
  - speech recognition, understanding, and synthesis
  - image understanding (computer vision)
  - B) Reasoning and Planning
- Reasoning and Planning
  - modeling the external world
  - problem solving, planning, and decision making
  - ability to deal with unexpected problems, uncertainty
- Learning and Adaptation
  - we are continuously learning and adapting
  - Also: we want systems that adapt to us!
  - Major thrust of industry research.

What is Artificial Intelligence

- **Rich and Knight**:
  - the study of how to make computers do things which, at the moment, people do better.
- **Handbook of AI:**
  - the part of computer science concerned with designing intelligent computer systems, that is, systems that exhibit the characteristics we associate with intelligence in human behavior - understanding language, learning, reasoning, solving problems, etc.
- **Dean, Allen and Aloimonos**:
  - the design and study of the computer programs that behave intelligently.
- **Russell and Norvig**:
  - the study of [rational] agents that exist in an environment and perceive and act.

Different Approaches

1. **Building exact models of human cognition**
   - view from psychology and cognitive science
2. **The logical thought approach**
   - emphasis on ``correct'' inference
3. **Building rational ``agents''**
   - agent: something that perceives and acts
   - emphasis on developing methods to match or
   - exceed human performance [in certain domains].
   - Example: Deep Blue

Goals in AI

- **Engineering Goal**
  - To solve real-world problems. Build systems that exhibit
  - intelligent behavior.

- **Scientific Goal**
  - To understand what kind of computational mechanisms
  - are needed for modeling intelligent behavior.