

# Introduction to Artificial Intelligence

ITK 340, Spring 2009

# For Wednesday

- Read Russell and Norvig, chapter 1
- Do chapter 1, exs 1 and 9
  - There's no single right answer for these. I'm looking for **thoughtful multiple sentence** responses.

# Due Friday

- Send email to [mecaliff@ilstu.edu](mailto:mecaliff@ilstu.edu) from your **preferred** email address
- Student information sheet

# Course Info

- Instructor
- Textbook
- Syllabus
- Students

# What is AI, anyway?

- Artificial Intelligence
- The artificial part is easy--we're building machines and computer programs
- Intelligence, however, is not well-defined
- Some things that require great intelligence in human being are easy for computers
- Other things that are easy for most (all?) humans are very difficult for computers

# Categorizing the Definitions

- Acting or thinking
  - Some definitions focus on thinking and reasoning, on the “mind” of the machine
  - Others focus on acting, on the behavior of the machine (whether there’s real thought behind it may not matter?)
- Human or rational
  - Some definitions measure the computer against humans
  - Others focus on rationality--an ideal concept of intelligence

# Thinking Humanly

- “The exciting new effort to make computers think ... *machines with minds*, in the full and literal sense” (Haugeland, 1985)
- “[The automation of] activities that we associate with human thinking, activities such as decision-making, problem solving, learning ...” (Bellman, 1978)

# Thinking Humanly

- The cognitive modeling approach
- Interested not only in solving the problem, but also in mimicking human thought processes
- This is where AI is most closely related to cognitive science

# Acting Humanly

- “The art of creating machines that perform functions that require intelligence when performed by people” (Kurzweil, 1990)
- “The study of how to make computers do things at which, at the moment, people are better” (Rich and Knight, 1991)

# Acting Humanly

- The “Turing Test” Approach
- Focus is on how the system behaves, not how it works inside
- Performance is measured against human performance
- Biggest problem is the question of the value of the test--but we can't pass it yet
- Development of practical systems

# Thinking Rationally

- “The study of mental faculties through the use of computational models” (Charniak and McDermott, 1985)
- “The study of the computations that make it possible to perceive, reason, and act” (Winston, 1992)

# Thinking Rationally

- The laws of thought approach
- Focus on logic--making correct inferences
- Problems
  - Difficulty of formulating some types of knowledge logically
  - Solving in principal vs. solving in practice
- Strong contributions in reasoning and knowledge representation

# Acting Rationally

- “A field of study that seeks to explain and emulate intelligent behavior in terms of computational processes” (Schalkoff, 1990)
- “The branch of computer science that is concerned with the automation of intelligent behavior” (Luger and Stubblefield, 1993)

# Acting Rationally

- The rational agent approach
- Instead of thinking the right way, focuses on doing the right thing
- More general than laws of thought
- More testable than comparing to human behavior
- Approach taken by your text

# What Do You Know?

- Examples of artificial intelligence in your life?
- Can you name any of the areas of AI?