CSE 473: Introduction to Artificial Intelligence

Instructor:

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Source materials

- **Required textbook:**
  Artificial Intelligence: A Modern Approach
  Stuart Russell and Peter Norvig
  Prentice-Hall
- **Recommended textbook:**
  Machine Learning
  Tom Mitchell
  McGraw-Hill
- **Papers**

What is AI?

- Automation of reasoning, problem solving, learning
- Study of mental faculties through computational models
- Making computers do what people currently do better
- Study of heuristic solutions to NP-complete problems

Administrivia

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Assignments

- Four homeworks (5% each)
  - Search (weeks 2–3)
  - Reasoning (weeks 4–5)
  - Uncertainty (weeks 6–7)
  - Learning (weeks 8–9)
- Two programming projects (20% each)
  - Satisfiability solver (weeks 3–6)
  - Ensemble learner (weeks 8–$10\frac{1}{2}$)
- Final (40%)

What can you do with AI?

- Beat Kasparov at chess
- Prove new theorems in mathematics
- Do medical diagnosis better than doctors
- Design new drugs
- Query databases in English
- Design a robot that runs errands

What can you do with AI? (contd.)

- Organize the deployment of US troops & equipment in the Gulf
- Solve complex scheduling problems in manufacturing
- Predict the stock market
- Create more realistic characters for computer games
- Design software agents that search the Web for you

Topics for this quarter

- Problem solving and search
- Representation and reasoning
- Uncertainty
- Machine learning
- Planning

Ancestors of AI

- Computer science
- Mathematics
- Philosophy
- Probability and statistics
- Decision theory and economics
- Psychology
- Biology
- Control systems
- Operations research

History of AI

- 50's: AI is born; neurons, games, logic
- 60's: Youthful enthusiasm; search, microworlds, the rift
- 70's: Knowledge representation
- 80's: AI becomes an industry; neural nets return
- 90's: AI matures; realistic applications, probability, learning, the Web