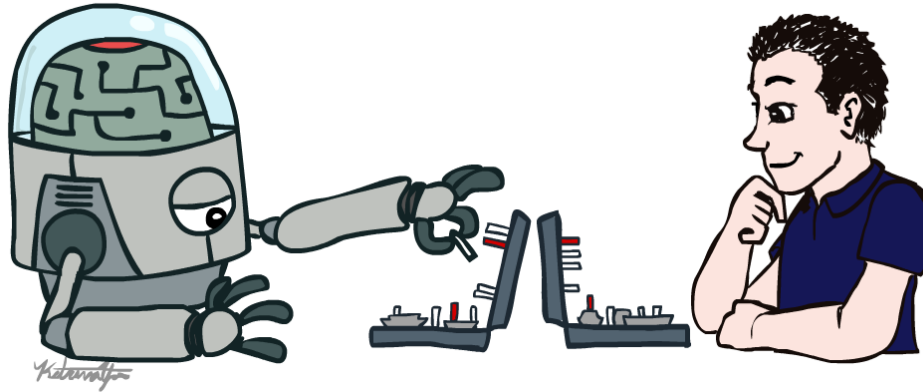


Advanced Topics in AI

What is AI?



Instructor: Prof. Dr. techn. Wolfgang Nejdl

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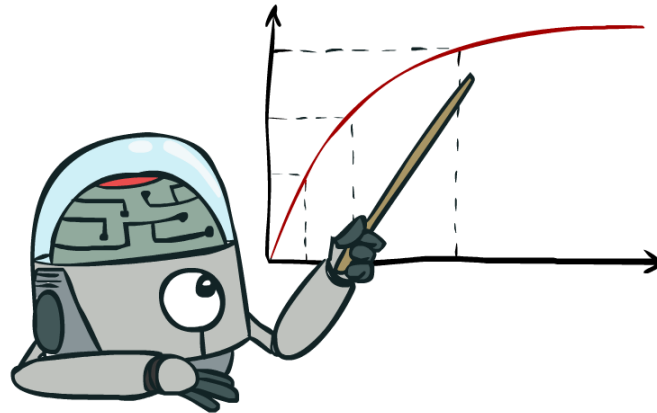
Rational Decisions

- We'll use the term **rational** in a very specific, technical way:
 - Rational: maximally achieving pre-defined goals
 - Rationality only concerns what decisions are made (not the thought process behind them)
 - Goals are expressed in terms of the utility of outcomes
- Being rational means maximizing your expected utility

A better title for this course would be:

Computational Rationality

Maximize Your Expected Utility

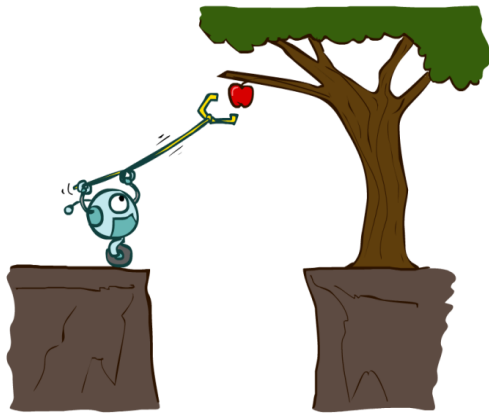


What About the Brain?

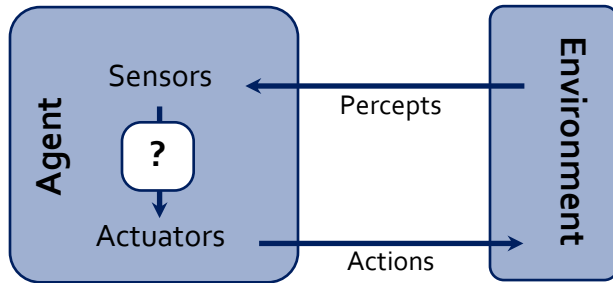
- Brains (human minds) are very good at making rational decisions, but not perfect
- Brains aren't as modular as software, so hard to reverse engineer!
- “Brains are to intelligence as wings are to flight”
- Lessons learned from the brain: memory and simulation are key to decision making



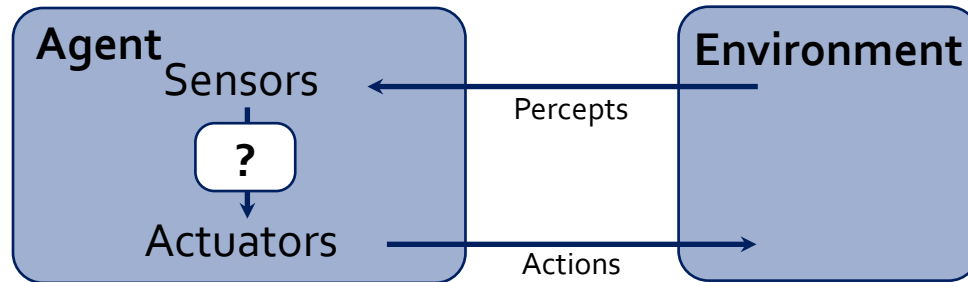
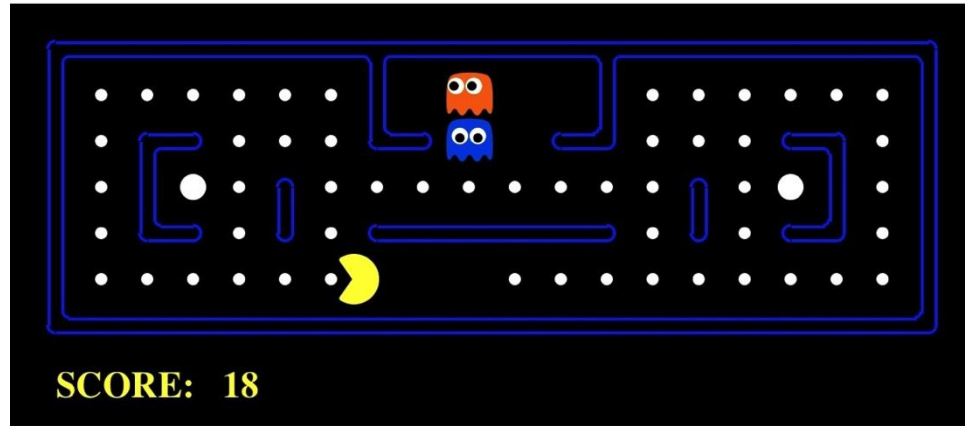
Designing Rational Agents



- An agent is an entity that perceives and acts.
- A rational agent selects actions that maximize its (expected) utility.
- Characteristics of the percepts, environment, and action space dictate techniques for selecting rational actions
- This course is about:
 - General AI techniques for a variety of problem types
 - Learning to recognize when and how a new problem can be solved with an existing technique



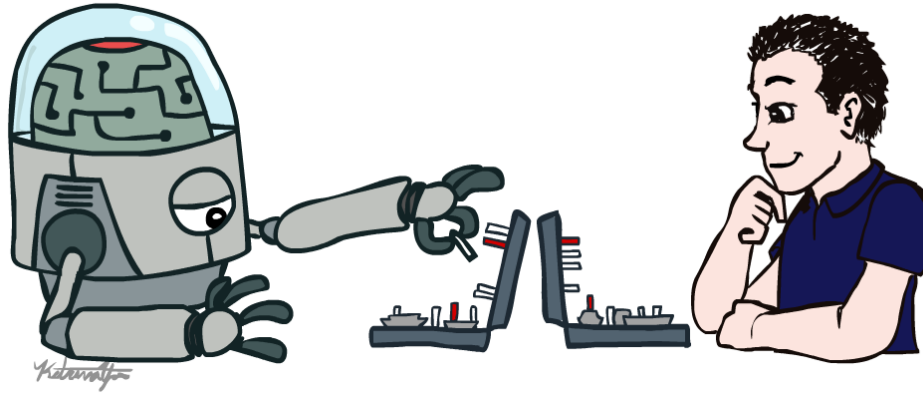
Pac-Man as an Agent



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Next: History of AI



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