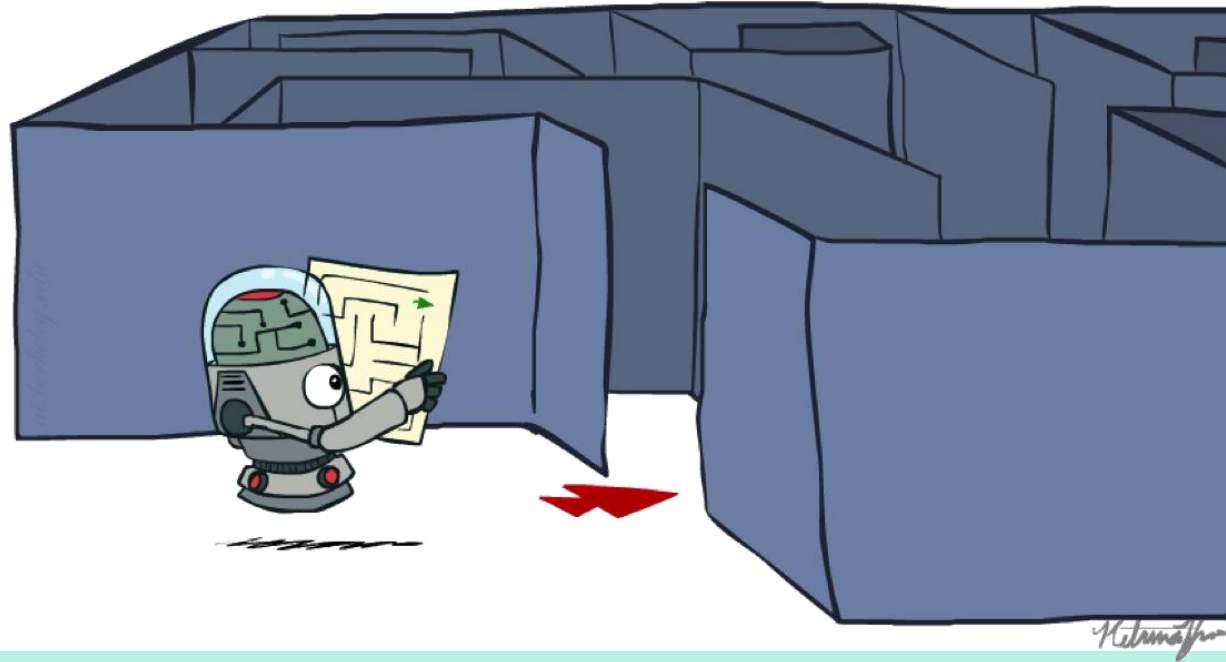


Advanced Topics in AI Search



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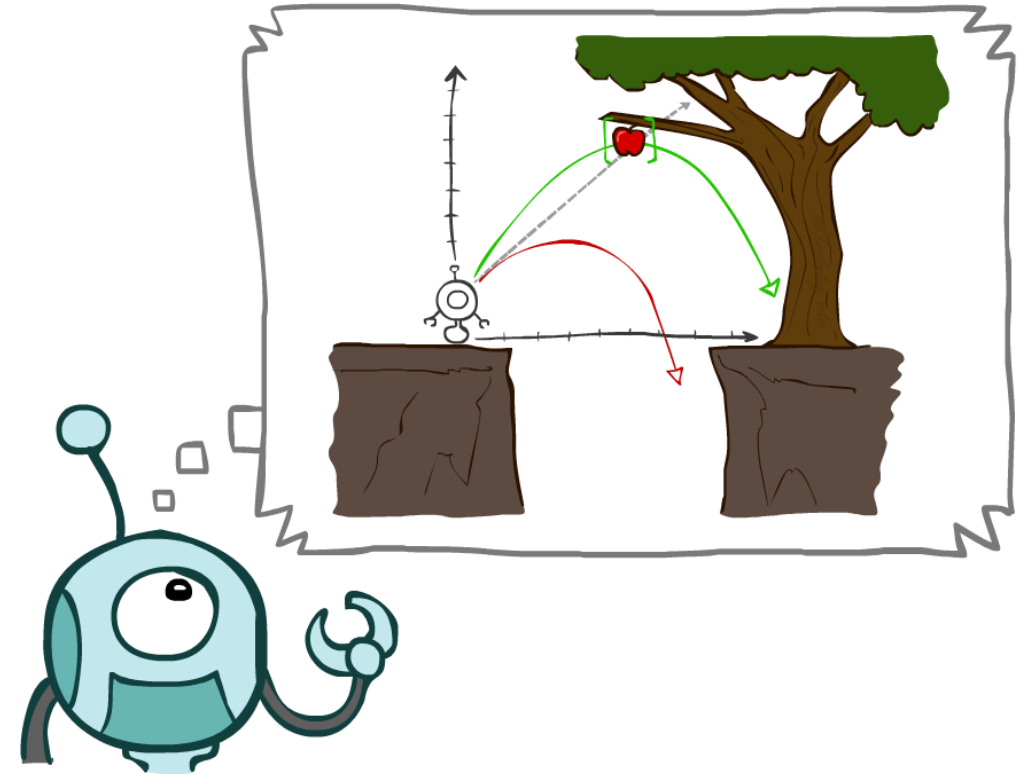
[These slides were created by Dan Klein and Pieter Abbeel for CS188 Intro to AI at UC Berkeley. All CS188 materials are available at <http://ai.berkeley.edu>.]



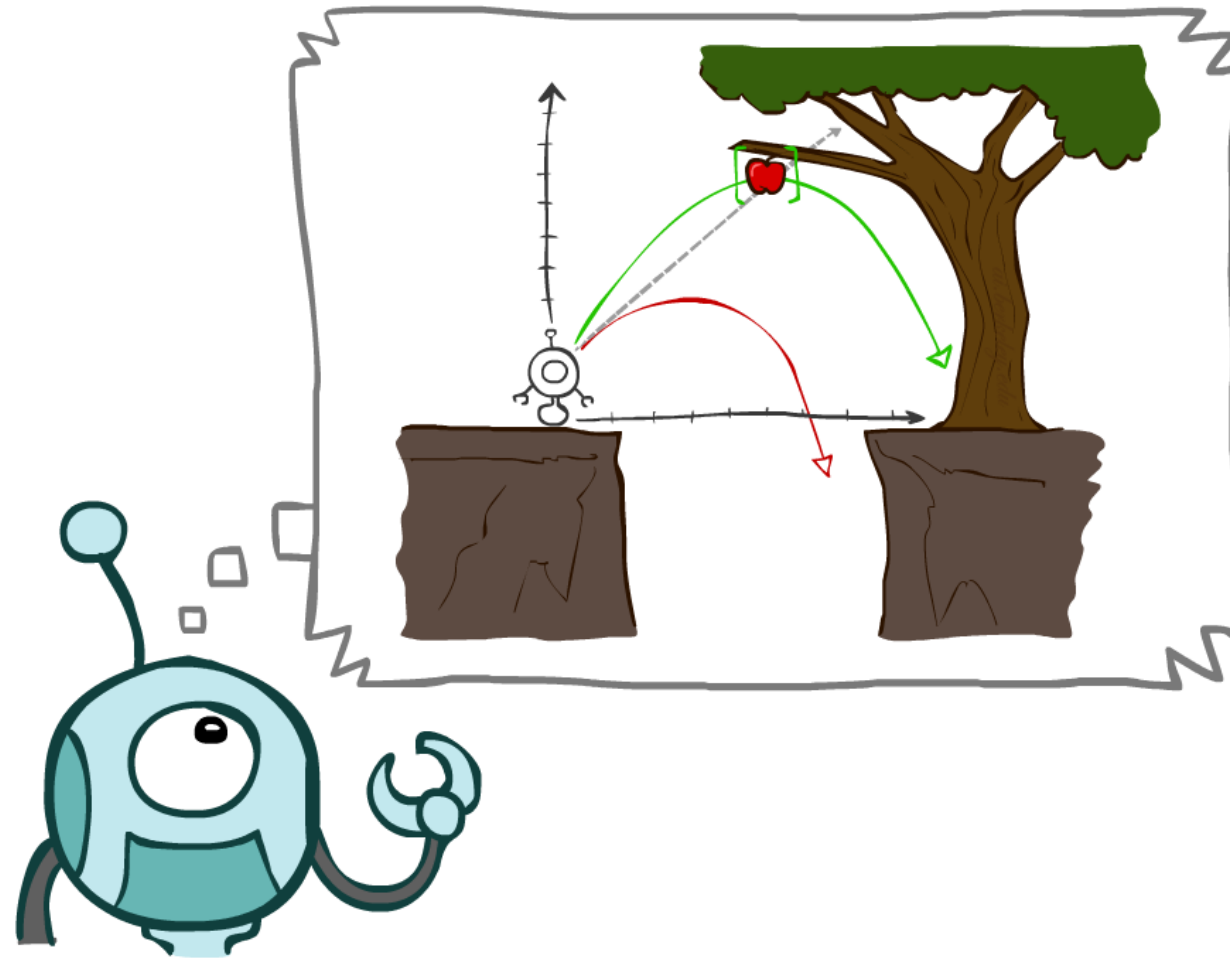
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In this Module

- Agents that Plan Ahead
- Search Problems
- Tree Search and Graph Search
- Uninformed Search Methods
 - Depth-First Search
 - Breadth-First Search
 - Uniform-Cost Search
- Informed Search Methods
 - Greedy Search
 - A* Search
- Heuristics

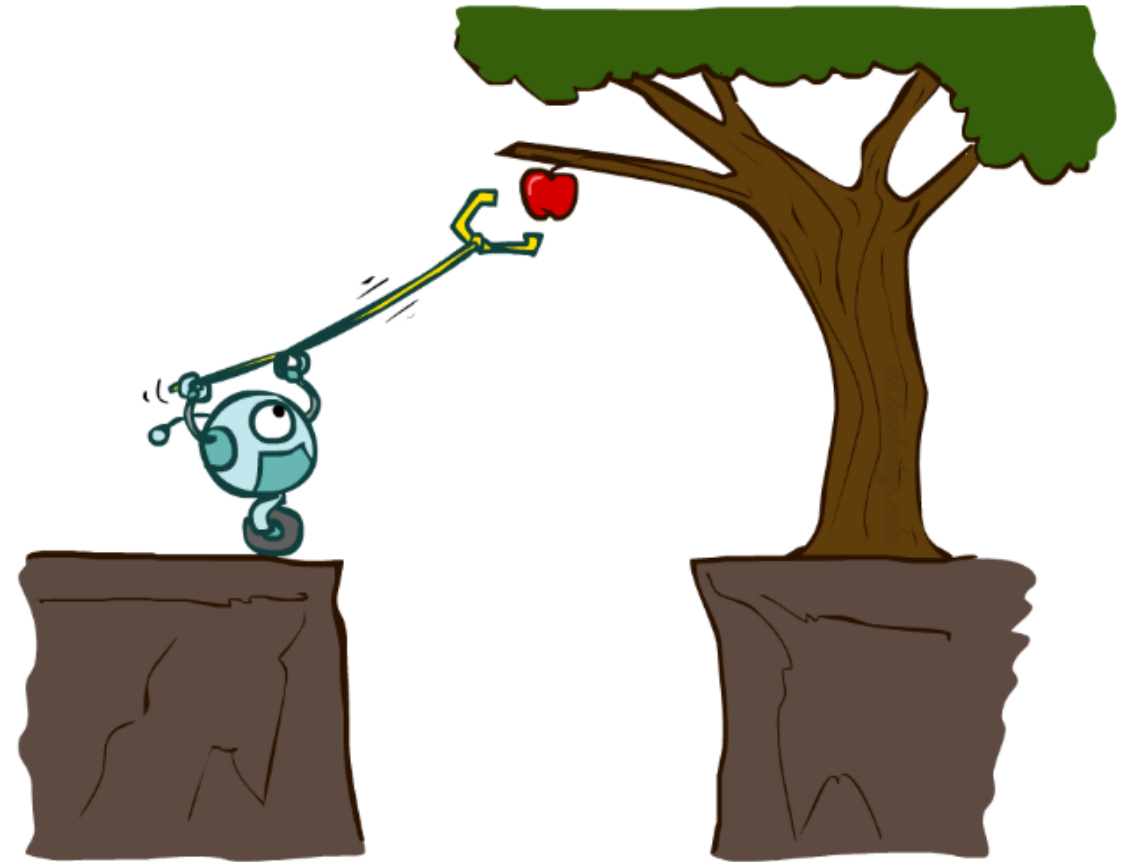


Agents that Plan



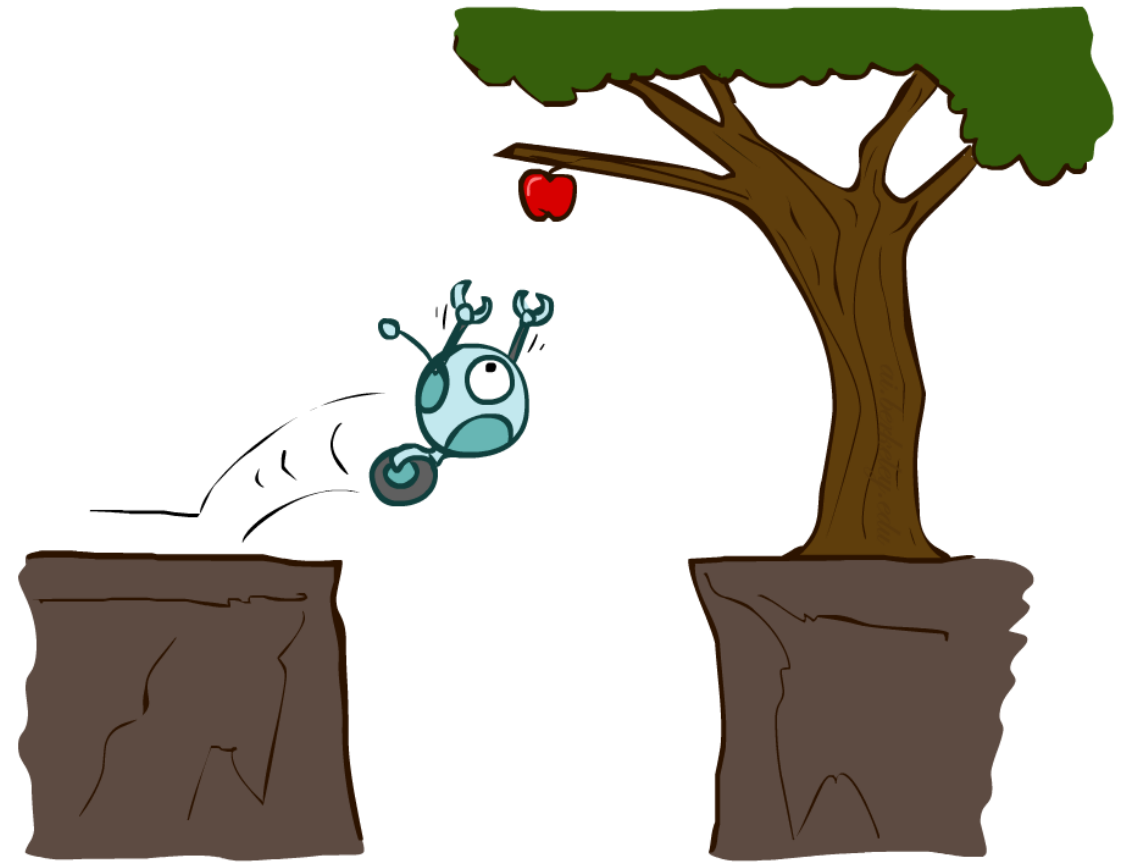
Remember: Designing Rational Agents

- 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



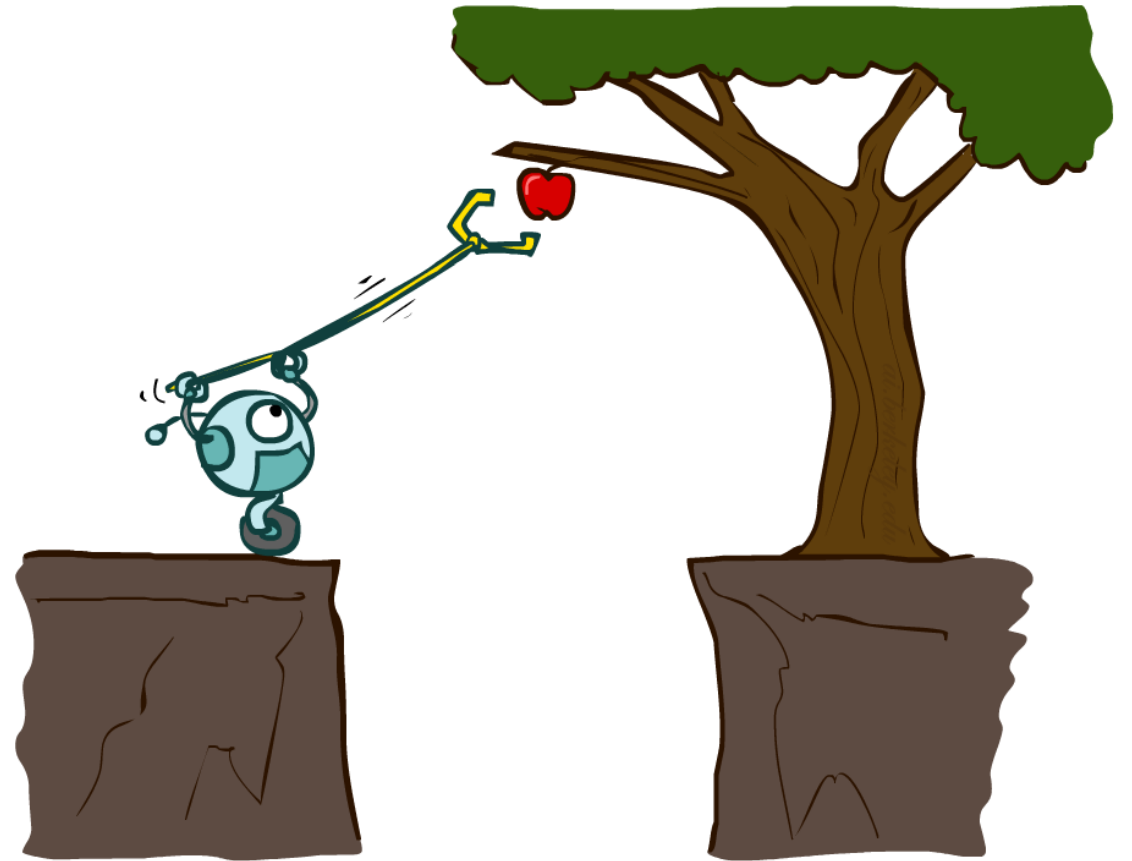
Reflex Agents

- Reflex agents:
 - Choose action based on current percept (and maybe memory)
 - May have memory or a model of the world's current state
 - Do not consider the future consequences of their actions
 - Consider how the world IS
- Can a reflex agent be rational?



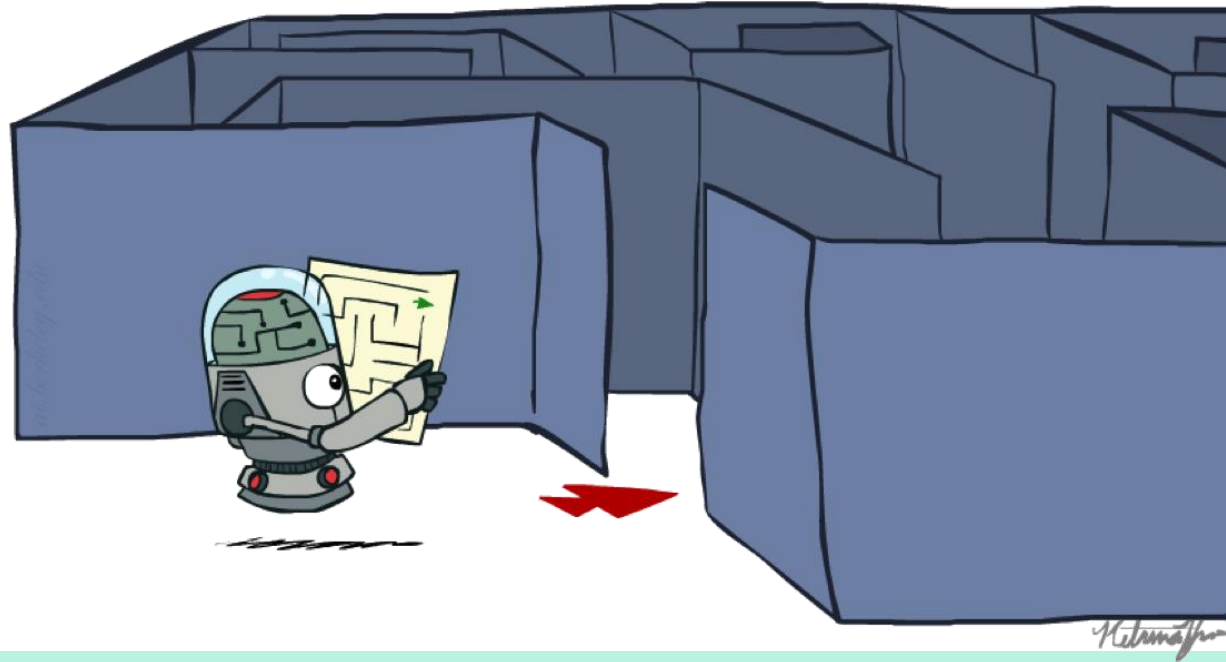
Planning Agents

- Planning agents:
 - Ask “what if”
 - Decisions based on (hypothesized) consequences of actions
 - Must have a model of how the world evolves in response to actions
 - Must formulate a goal (test)
 - Consider how the world **WOULD BE**
- Optimal vs. complete planning
- Planning vs. replanning



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Next: Search problems



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