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# A Summary of the Most Important AI Principles

# Rational Agents

Understand the behavior of devices as rational agents.

- A rational agent chooses actions to maximize expected utility.
- What is the utility function?
- How is the world represented?
  - Examples: state space search, CSPs, Bayes/decision networks
- How is one action chosen over another?

# Machine Learning

Understand machine learning as reducing error.

- Learning is improvement of behavior based on experience.
- What is the error measurement?
- What kind of hypothesis is being learned?
  - hypothesis = function of input features and updatable parameters/structure
- Update to reduce error for past and future examples.
  - Gradient Descent

# Probability

Understand the world as probabilistic.

- Actions can fail.  
Beliefs can be wrong.  
Perceptions can be misleading.
- Probabilities represent uncertainty/ignorance.
- Best result is achieved by probabilistic reasoning based on evidence.
- Agents that use probabilities correctly will outperform agents who don't.