Background
Machine Learning: Supervised Learning

Training data \((x_i, y_i)\) → Model \(y = f(x)\) → Predictions

Need a lot of labeled data

Cat recognition
Deep Learning
Transfer Learning

In a learning task, the number of labeled data is very limited
Solution: Transfer learning
It utilizes a large amount of labeled data from other related task(s).
Multi-Task Learning

In several learning tasks, the numbers of labeled data are very limited.
Solution: Multi-Task Learning
It learns multiple learning tasks jointly.
Reinforcement Learning

• Characteristics
  • There is only a reward signal
  • Reward signal is delayed

• Mathematical Models
  • Markov Decision Process (MDP)
  • Partially Observable MDP