RL: Introduction

The Big Picture

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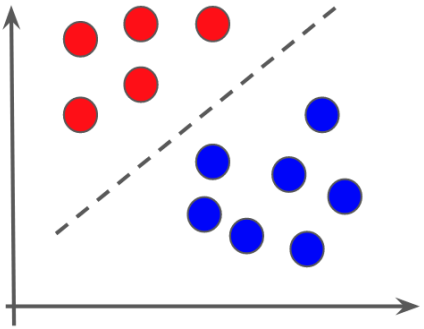
Machine Learning

"Machine learning is the science of getting computers to act without being explicitly programmed."

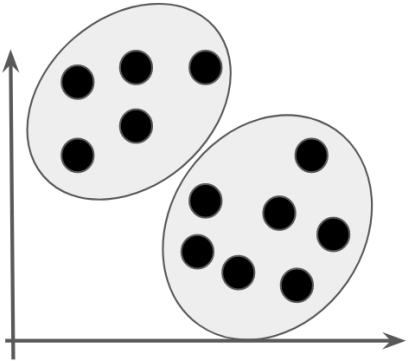
by Andrew Ng

Supervised Learning



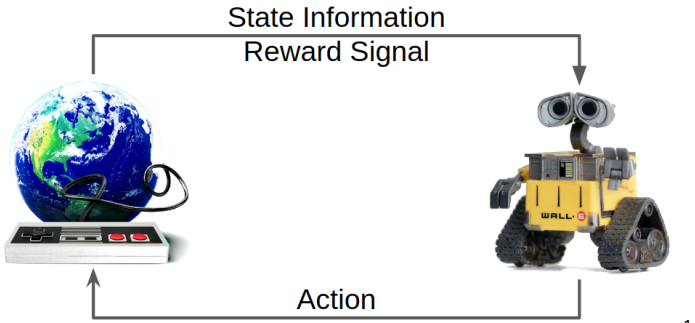
- Data: Features + Labels
- Task: Discriminate classes based on features

Unsupervised Learning



- Data: Features
- Task: Find structure in feature observations

Reinforcement Learning



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- Data: Self-acquired observations + rewards
- Task: Learn how to behave s.t. reward is maximized

$\rightsquigarrow$ Not a single decision, but a sequence of good decisions

[1] Image source: Morning Brew and Marius Haakestad on Unsplash

The Future of AI?

- Sometimes we have a lot of labeled data
- Sometimes we have little labeled data
- Sometimes we can interact with our environment
- Sometimes we have well-defined reward signals

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⇝ The future of AI will need a combination of many aspects

⇝ The recent breakthroughs in RL were triggered by breakthroughs in supervised DL