

# Introduction to Machine Learning

What is Machine Learning?

Machine learning is a subfield of artificial intelligence (AI) that focuses on building systems that learn from data.

Types of Machine Learning:

1. Supervised Learning - Training data includes input-output pairs.
2. Unsupervised Learning - Model learns patterns from input data without labeled outputs.
3. Reinforcement Learning - Agent learns actions based on rewards and penalties.

Examples of Algorithms:

- Supervised: Linear Regression, Decision Trees, Support Vector Machines
- Unsupervised: K-Means Clustering, Principal Component Analysis
- Reinforcement: Q-Learning, Deep Q-Networks

Applications:

- Email spam detection
- Image recognition
- Fraud detection
- Personalized recommendations