

# Machine Learning Overview

## Machine Learning Fundamentals

### What is Machine Learning?

Machine Learning is a subset of artificial intelligence that enables systems to learn and improve from experience without being explicitly programmed. It focuses on developing algorithms that can access data and use it to learn for themselves.

### Types of Machine Learning

#### Supervised Learning

In supervised learning, the algorithm learns from labeled training data to make predictions.

Common algorithms:

- Linear

Applications:

- Email

#### Unsupervised Learning

In unsupervised learning, the algorithm finds patterns in unlabeled data.

Common algorithms:

- K-Means

Applications:

- Customer Segmentation

#### Reinforcement Learning

The algorithm learns by interacting with an environment and receiving feedback.

Key concepts:

- Agent

Applications:

- Game

## Model Evaluation Metrics

### Classification Metrics

- Accuracy

### Regression Metrics

- Mean

## Common Challenges

### Overfitting

- Model

### Underfitting

- Model

### Data Quality Issues

- Missing

## Feature Engineering

- Selection

## Best Practices

- Start simple, then add complexity

- Always