

Machine Learning Fundamentals

1. Introduction to Machine Learning

Machine learning is a subset of artificial intelligence that enables computers to learn and make decisions from data without being explicitly programmed for every task.

1.1 What is Machine Learning?

Machine learning algorithms build mathematical models based on training data to make predictions or decisions.

1.1.1 Types of Learning

There are three main types of machine learning: supervised, unsupervised, and reinforcement learning.

1.1.2 Applications

Machine learning is used in various applications including image recognition, natural language processing, and recommendation systems.

2. Supervised Learning

Supervised learning uses labeled training data to learn a mapping from inputs to outputs.

2.1 Classification

Classification algorithms predict discrete class labels for input data.

2.1.1 Decision Trees

Decision trees create a model that predicts target values by learning simple decision rules inferred from data features.

2.2 Regression

Regression algorithms predict continuous numerical values rather than discrete classes.