

My Machine Learning Guide

Fawaz Shah

Contents

I. Supervised Learning	2
1. Regression	2
1.1. Cost functions	2
1.2. Linear regression	2
1.3. Logistic regression	2
2. Classification	2
2.1. PCA - Principal Component Analysis	2
II. Unsupervised Learning	3
3. Clustering	3
3.1. K-means clustering	3
III. Reinforcement Learning	4

Part I.

Supervised Learning

Supervised learning methods can be split into two types: regression problems and classification problems.

In all supervised learning methods we have a **training set**, which is a collection of data which we already know the right answers for.

1. Regression

Regression methods are used for predicting continuous data.

1.1. Cost functions

A popular cost function is the **mean squared error**.

$$E = \frac{1}{2n} \sum_{i=1}^n (f(x_i) - y_i)^2 \quad (1)$$

1.2. Linear regression

1 variable

More than 1 variable

1.3. Logistic regression

1 variable

More than 1 variable

2. Classification

Classification methods are used for predicting discrete data. We try to group data into categories.

2.1. PCA - Principal Component Analysis

Dimensionality reduction

Part II.

Unsupervised Learning

3. Clustering

3.1. K-means clustering

Part III.

Reinforcement Learning