

Part 3

Unsupervised learning

In the third part of the book, we'll review unsupervised learning algorithms. Unsupervised learning takes place when no training labels are available. In the case of unsupervised learning, we are often interested in discovering patterns in data and learning data representations.

In chapter 8, we'll start by looking at the Bayesian nonparametric extension of the K-means algorithm followed by the EM algorithm for Gaussian mixture models. We will then look at two different dimensionality reduction techniques—namely, PCA and t-SNE applied to learning an image manifold.

In chapter 9, we'll continue the discussion on selected unsupervised learning algorithms. We'll start by looking at latent Dirichlet allocation for learning topic models, followed by density estimators and structure learning algorithms, and concluding with simulated annealing and genetic algorithms. Finally, we'll review ML research literature, focusing on unsupervised learning.