

Machine Learning

Basics

Lecture slides for Chapter 5 of *Deep Learning*

www.deeplearningbook.org

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Linear Regression

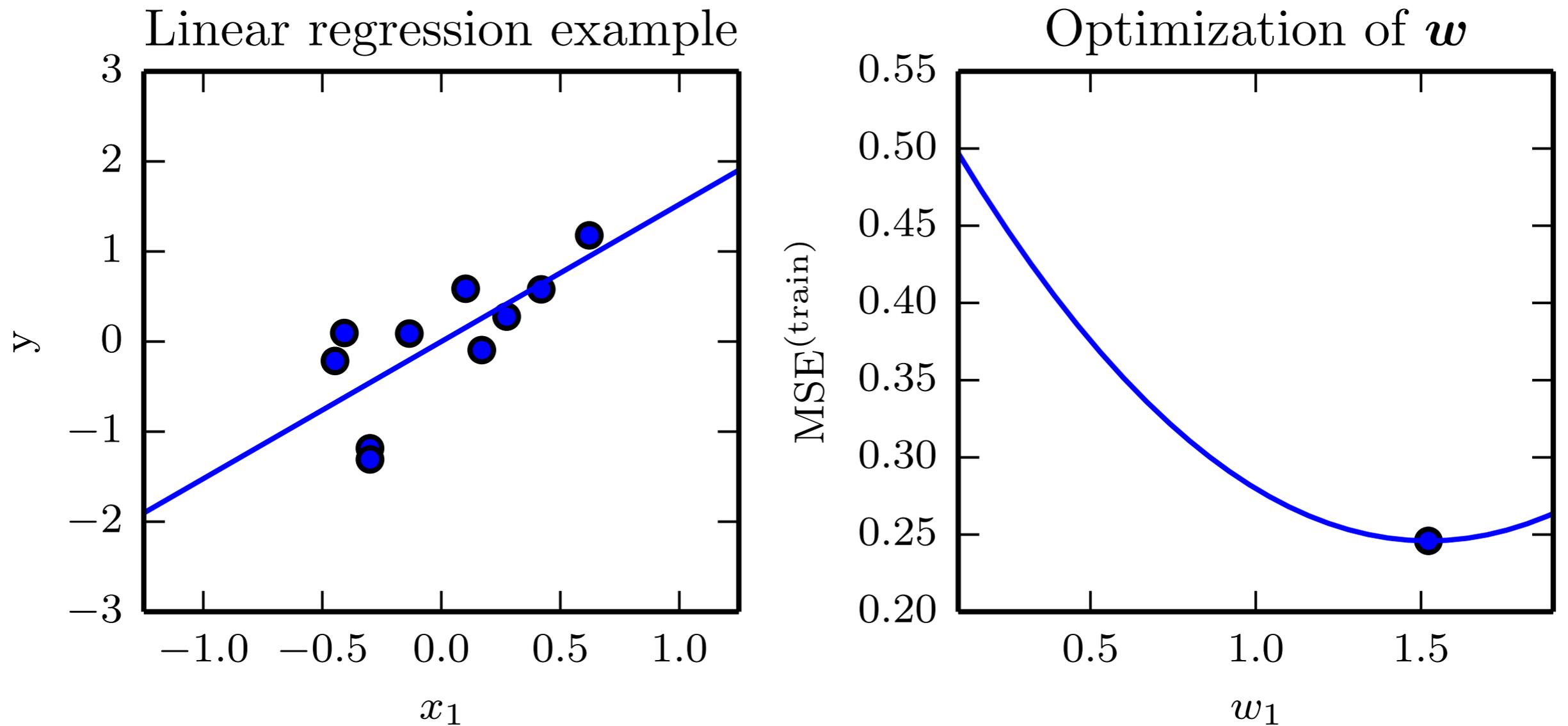


Figure 5.1

Underfitting and Overfitting in Polynomial Estimation

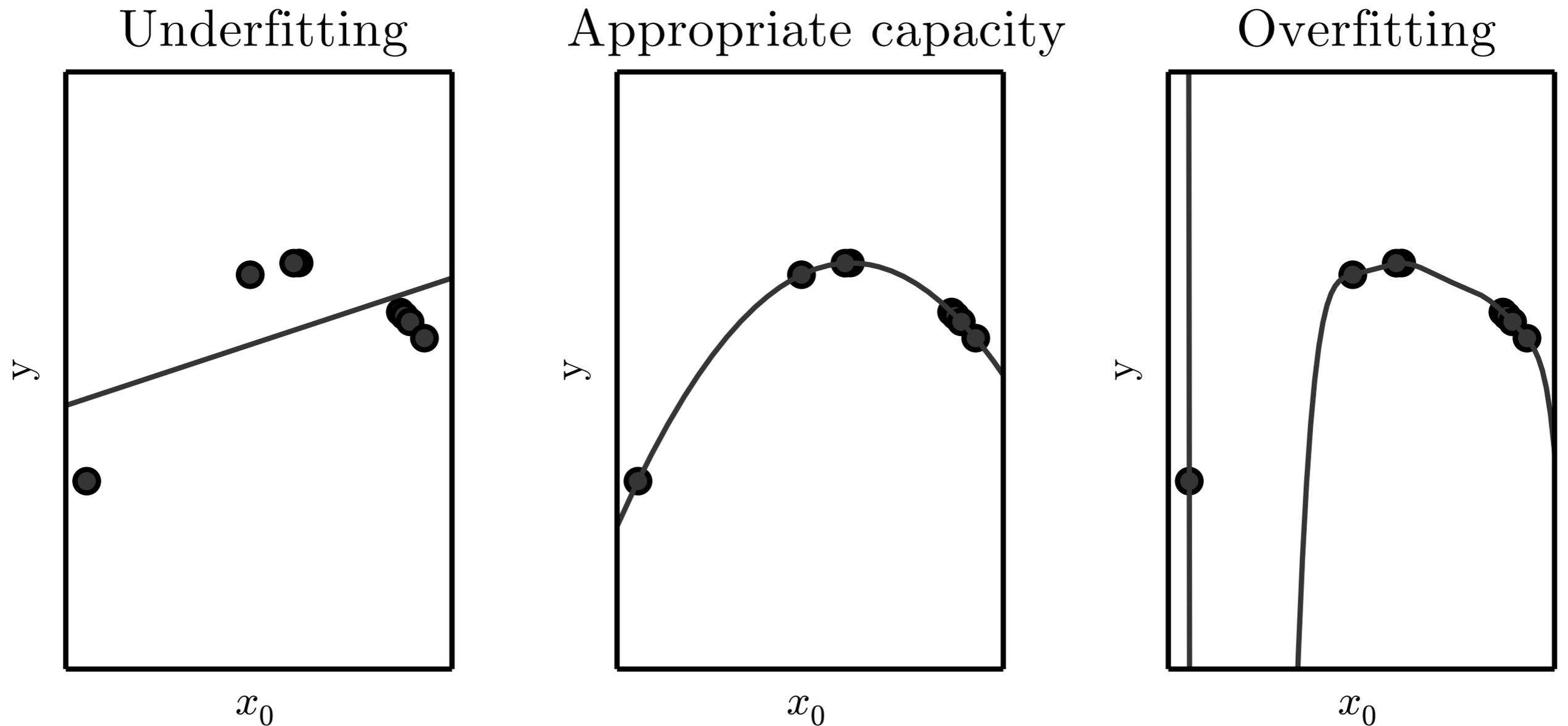


Figure 5.2

Generalization and Capacity

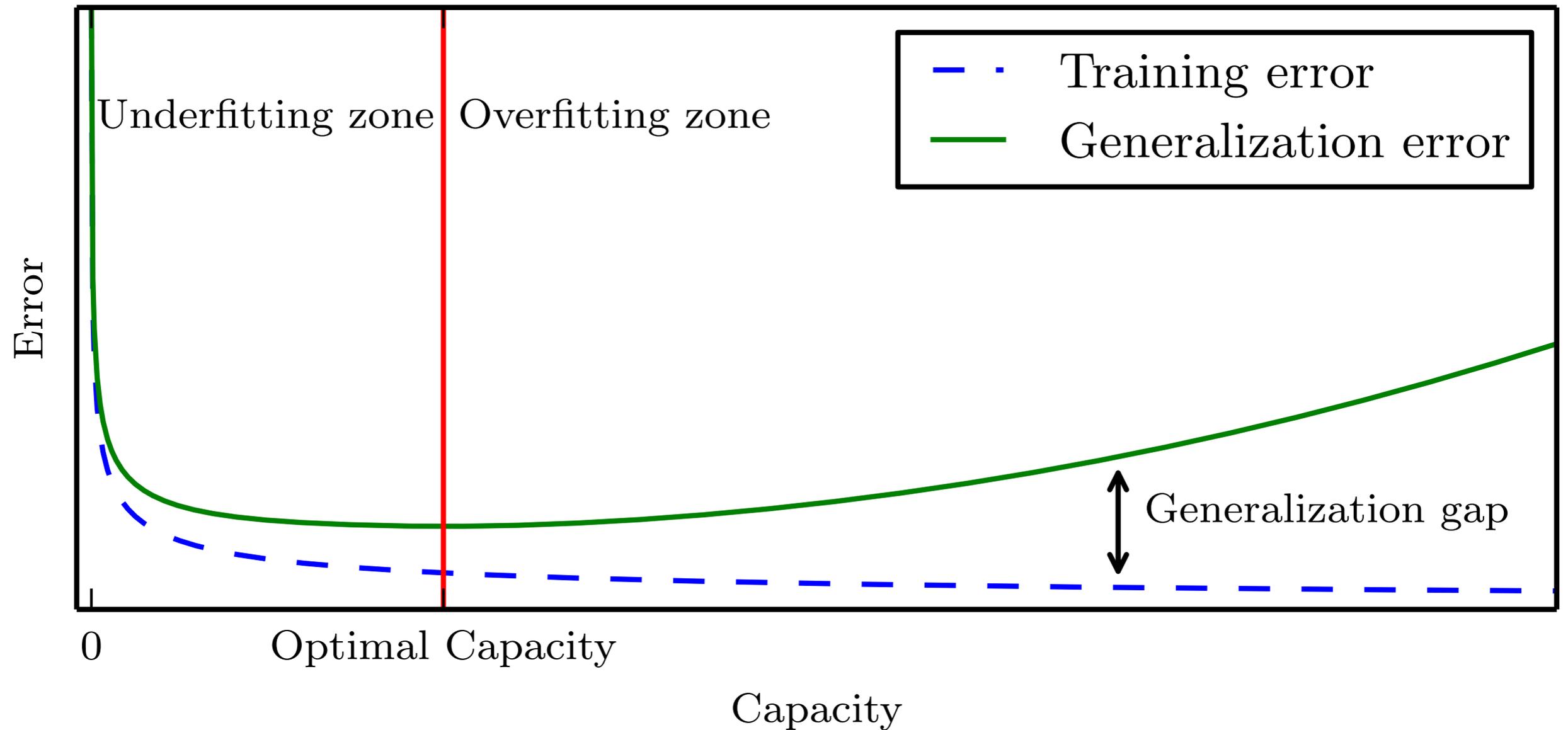


Figure 5.3

Training Set Size

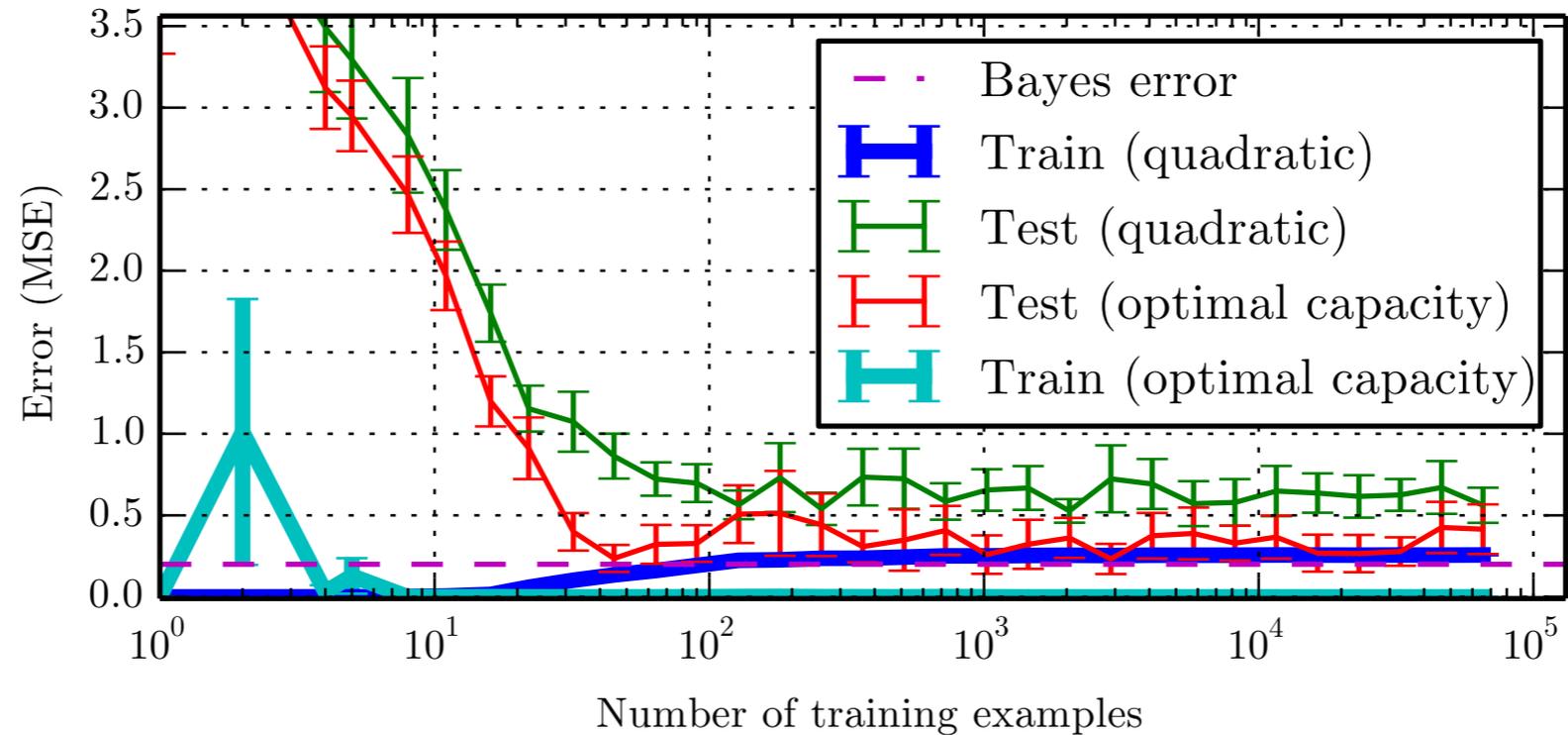
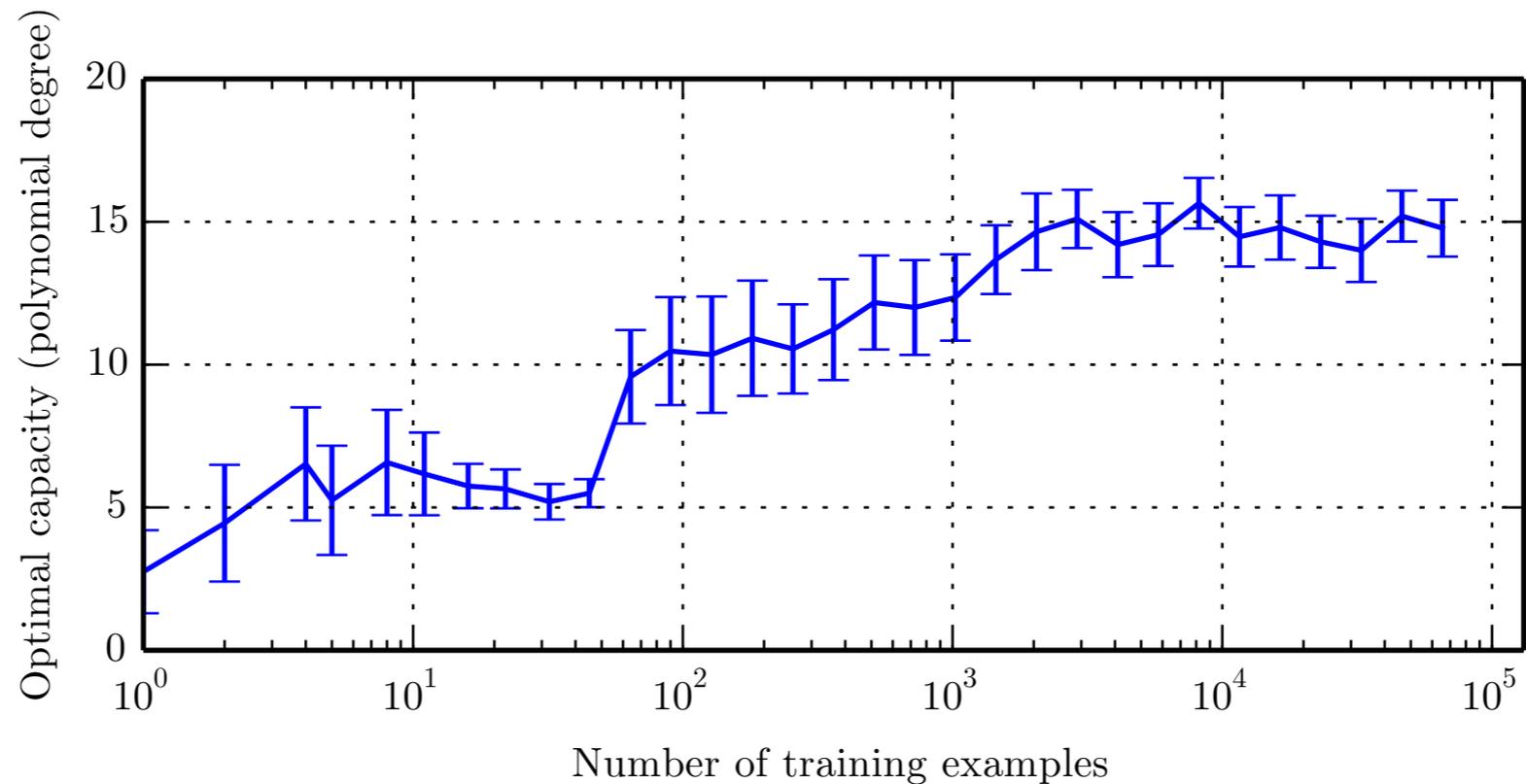
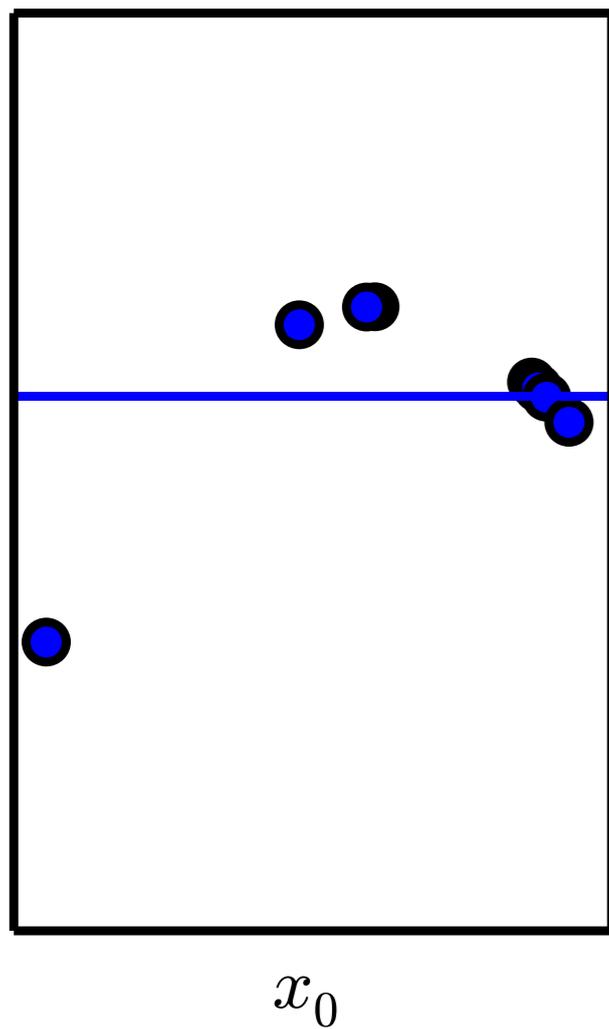


Figure 5.4

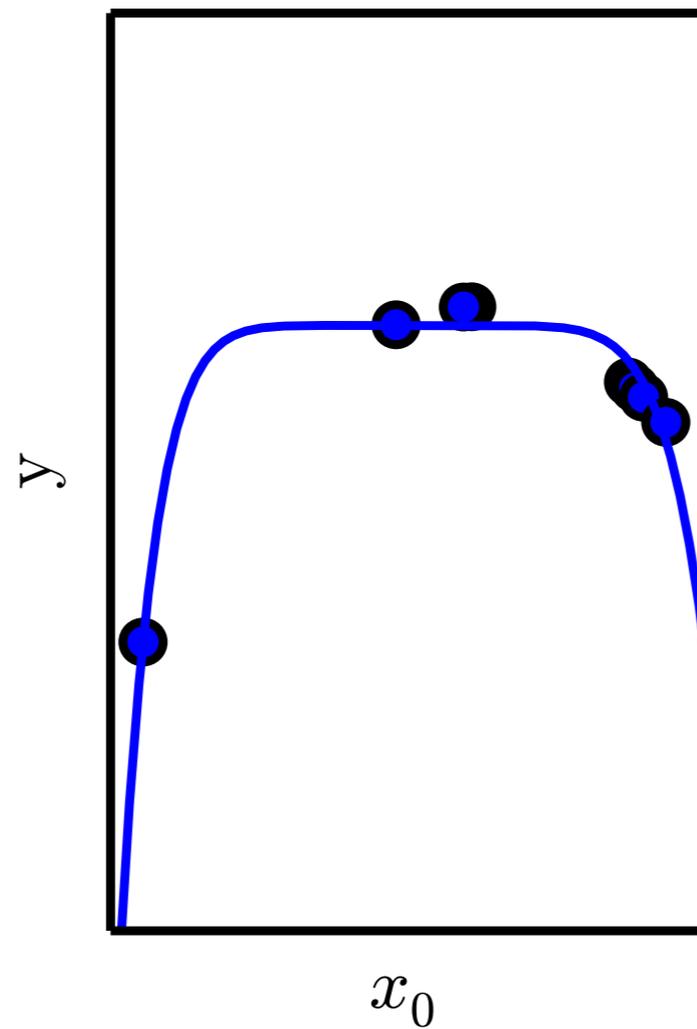


Weight Decay

Underfitting
(Excessive λ)



Appropriate weight decay
(Medium λ)



Overfitting
($\lambda \rightarrow 0$)

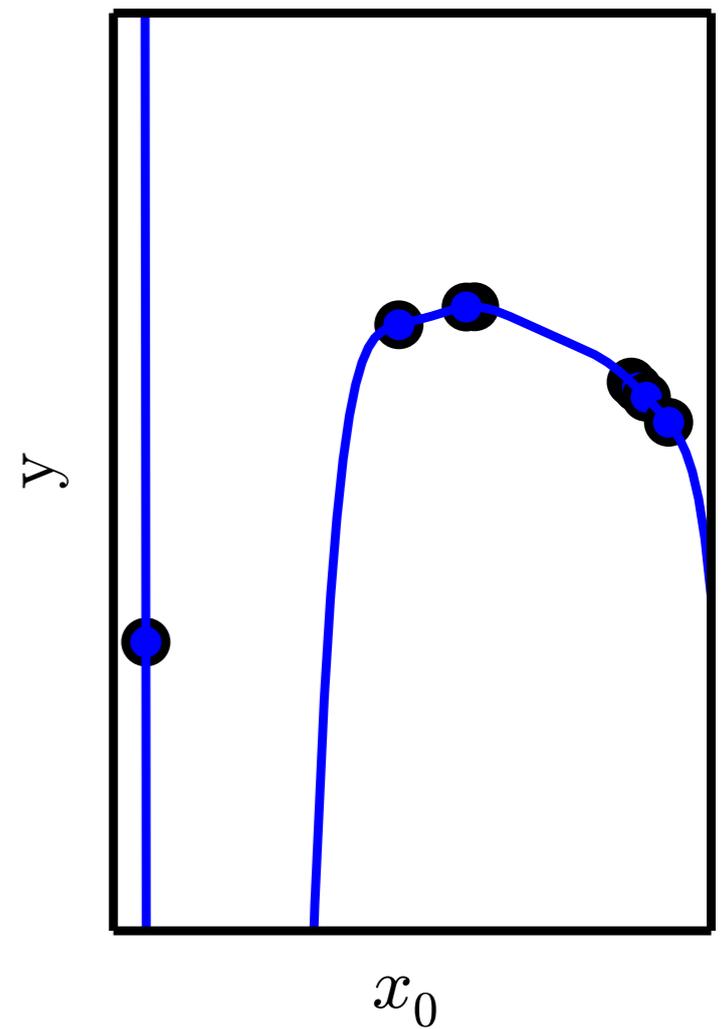


Figure 5.5

Bias and Variance

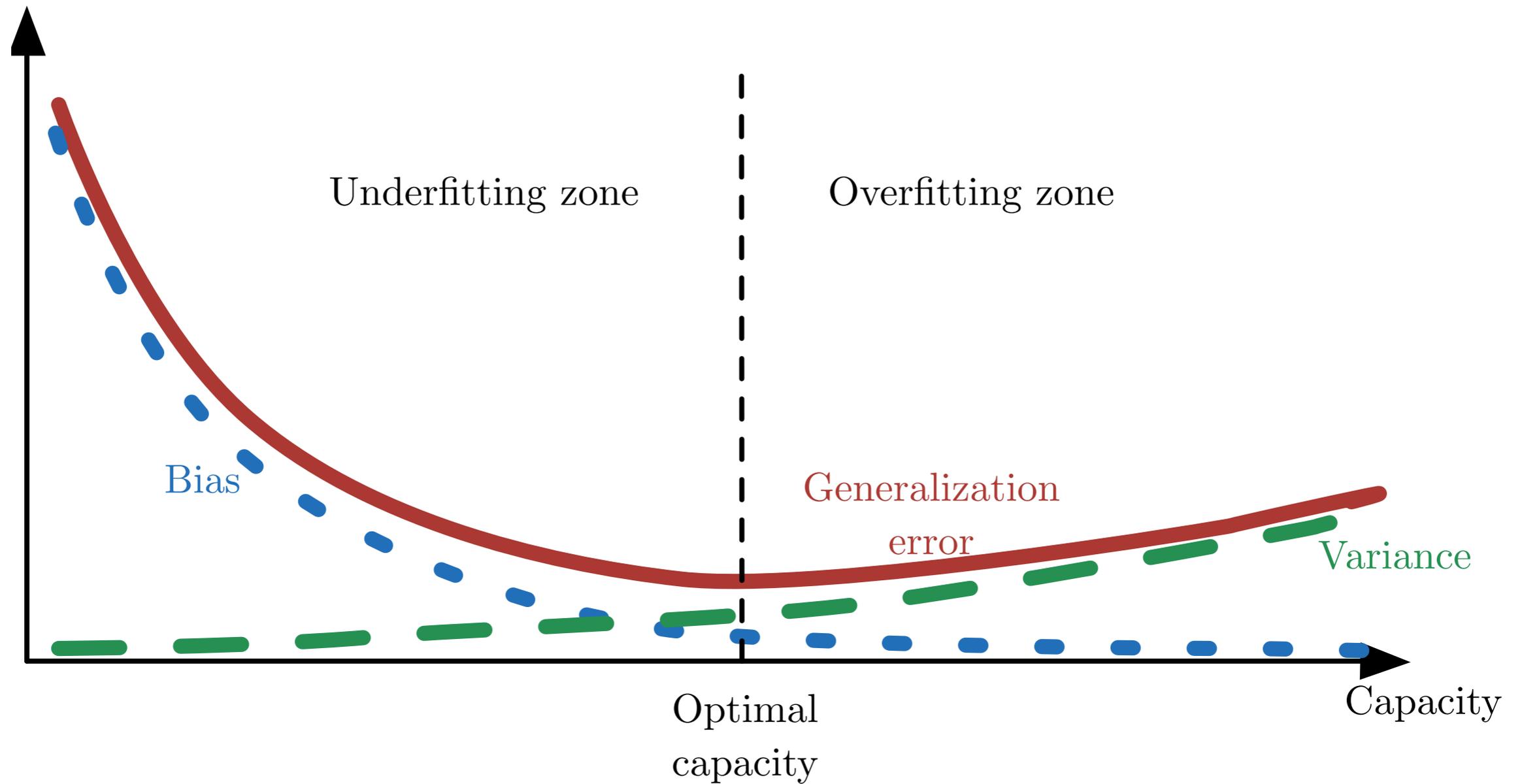


Figure 5.6

Decision Trees

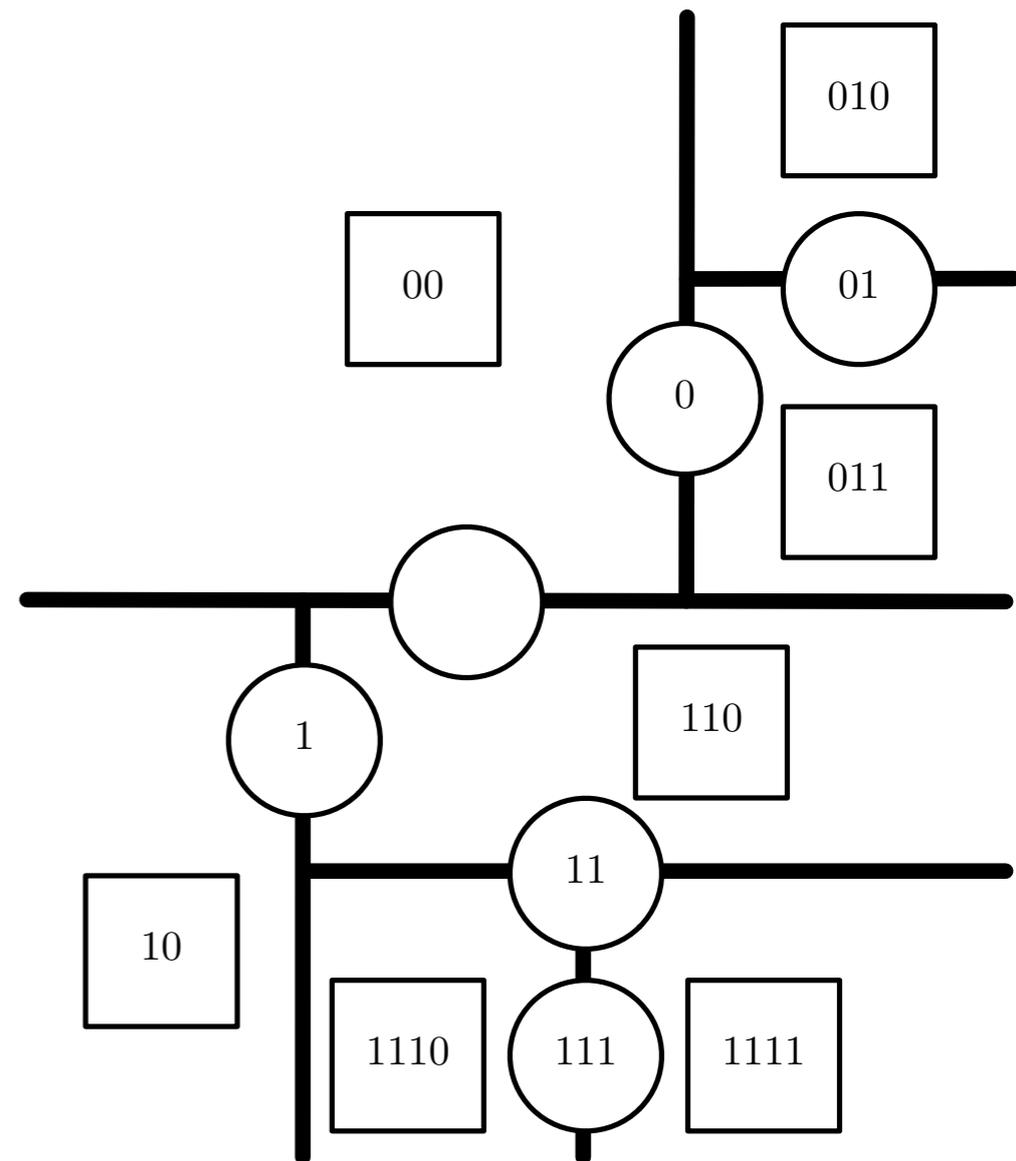
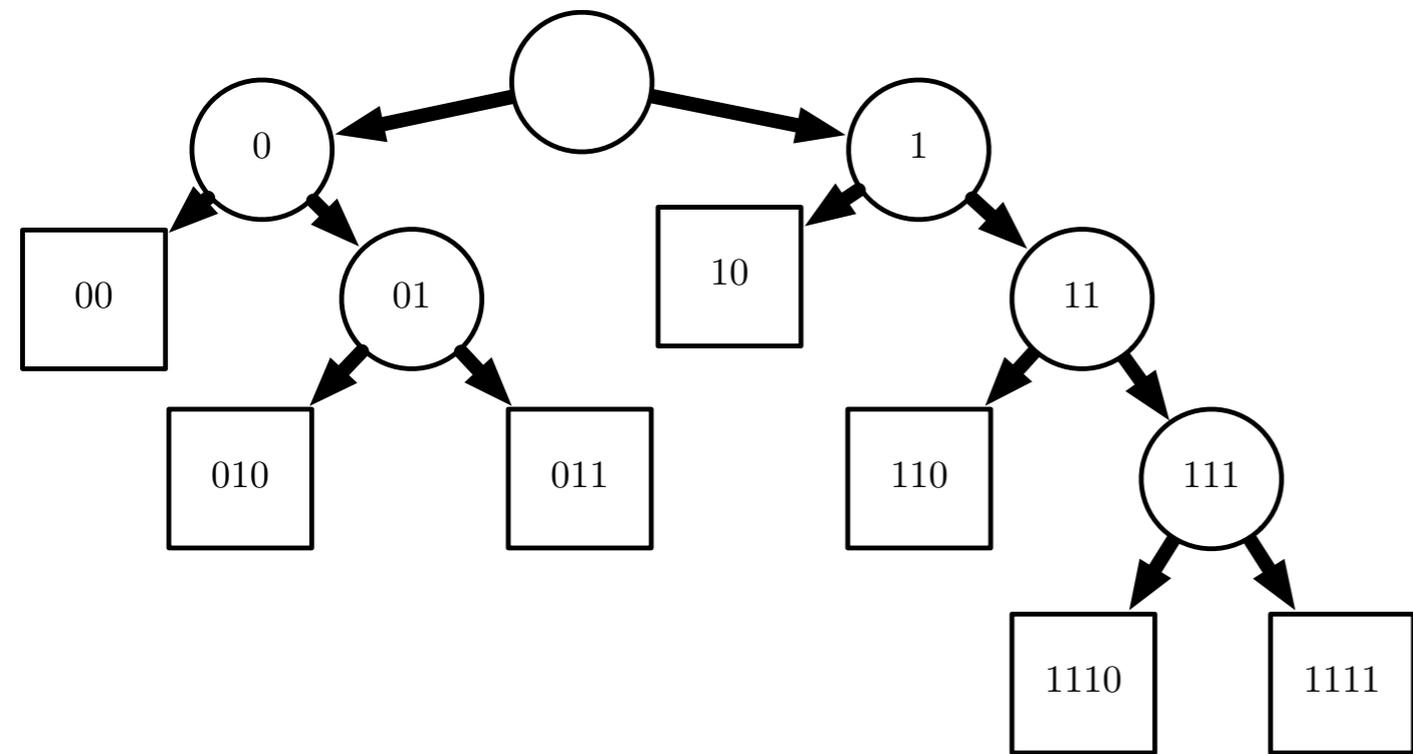


Figure 5.7

Principal Components Analysis

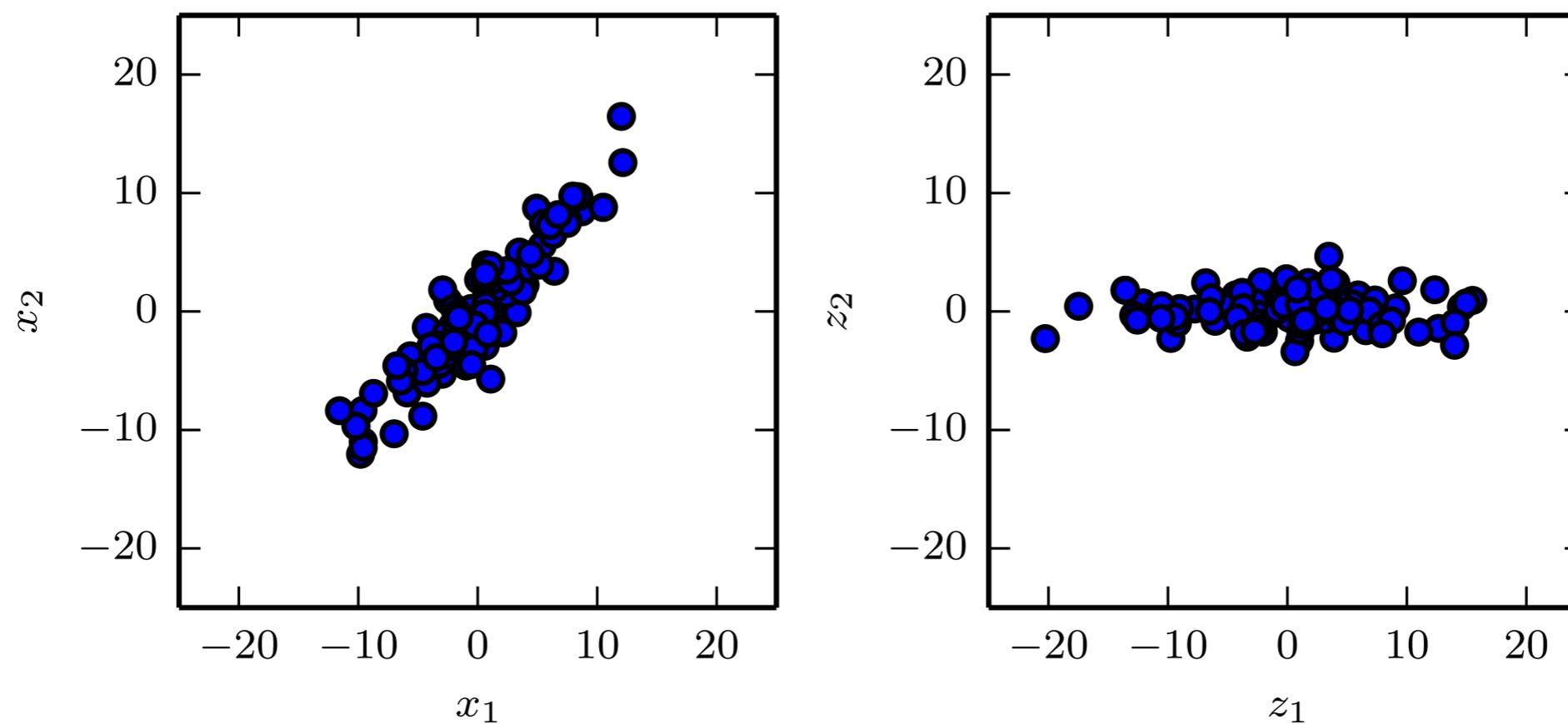


Figure 5.8

Curse of Dimensionality

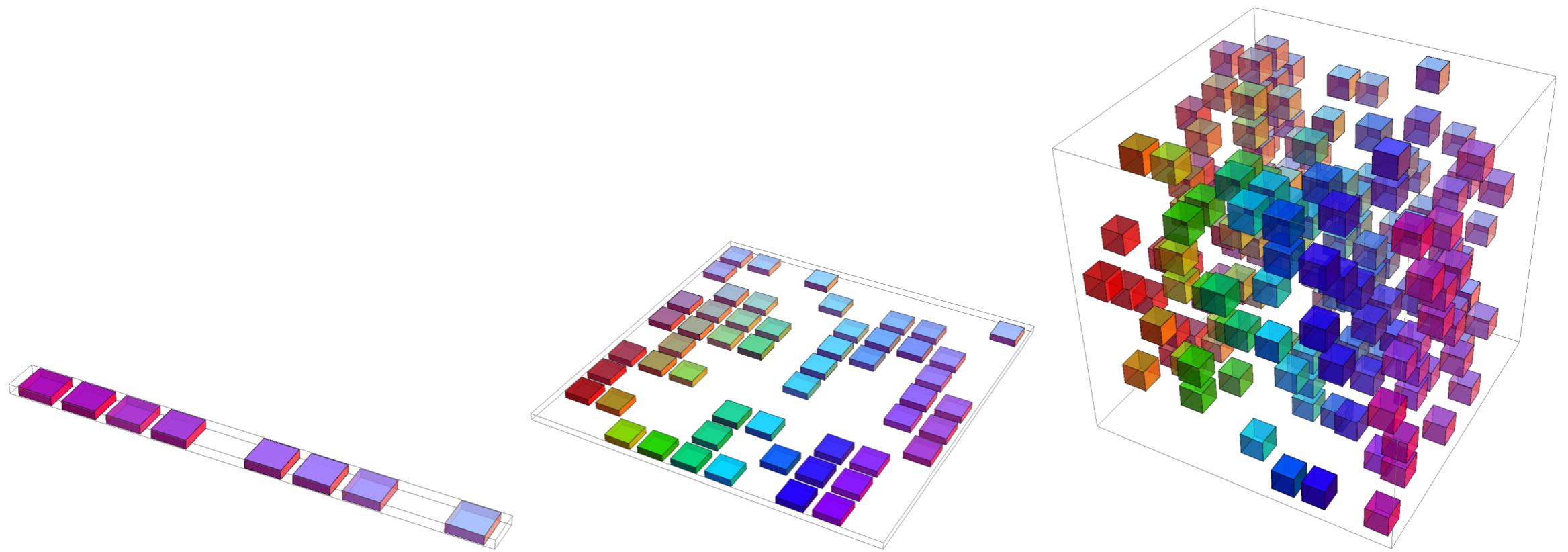


Figure 5.9

Nearest Neighbor

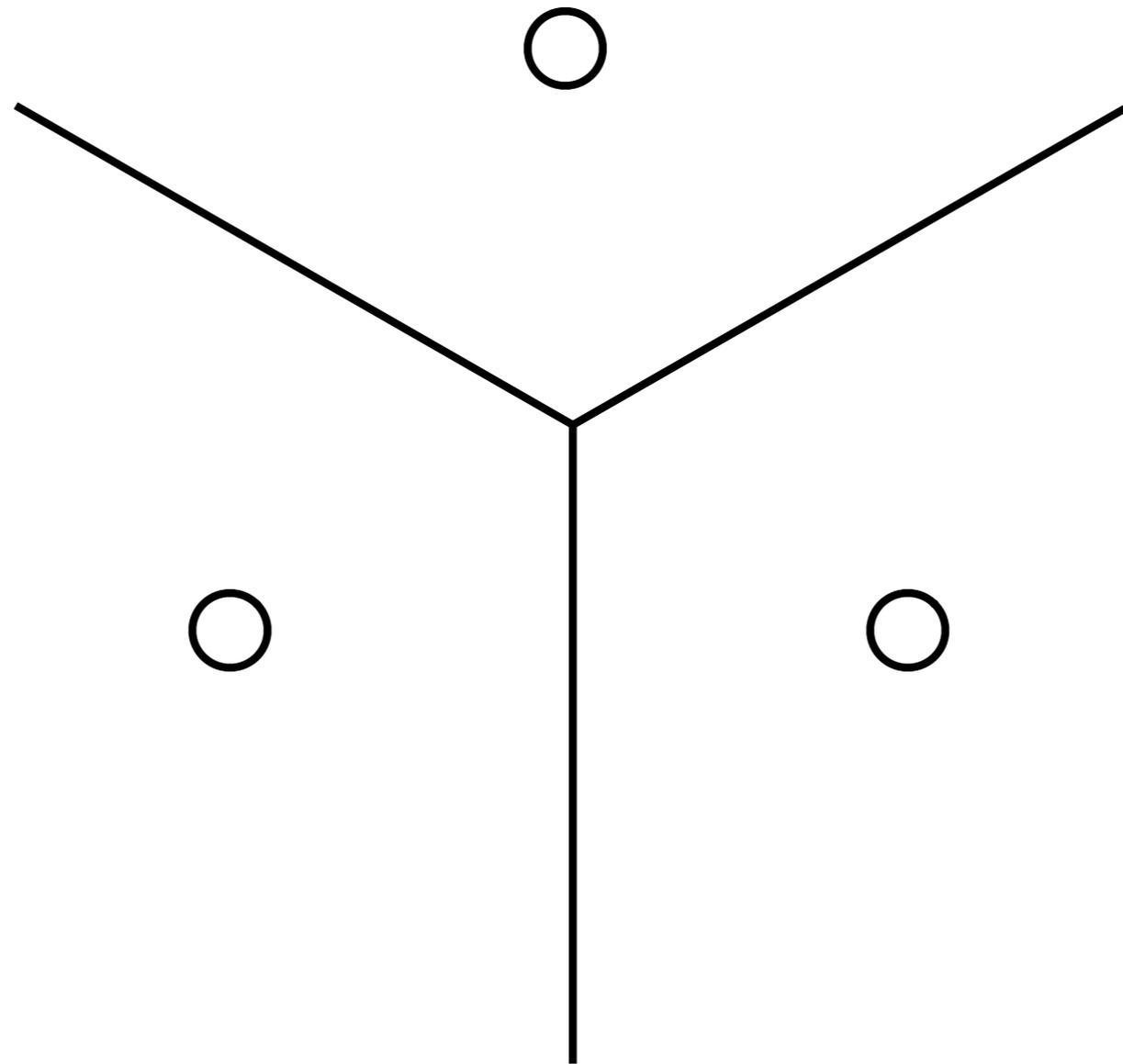


Figure 5.10

Manifold Learning

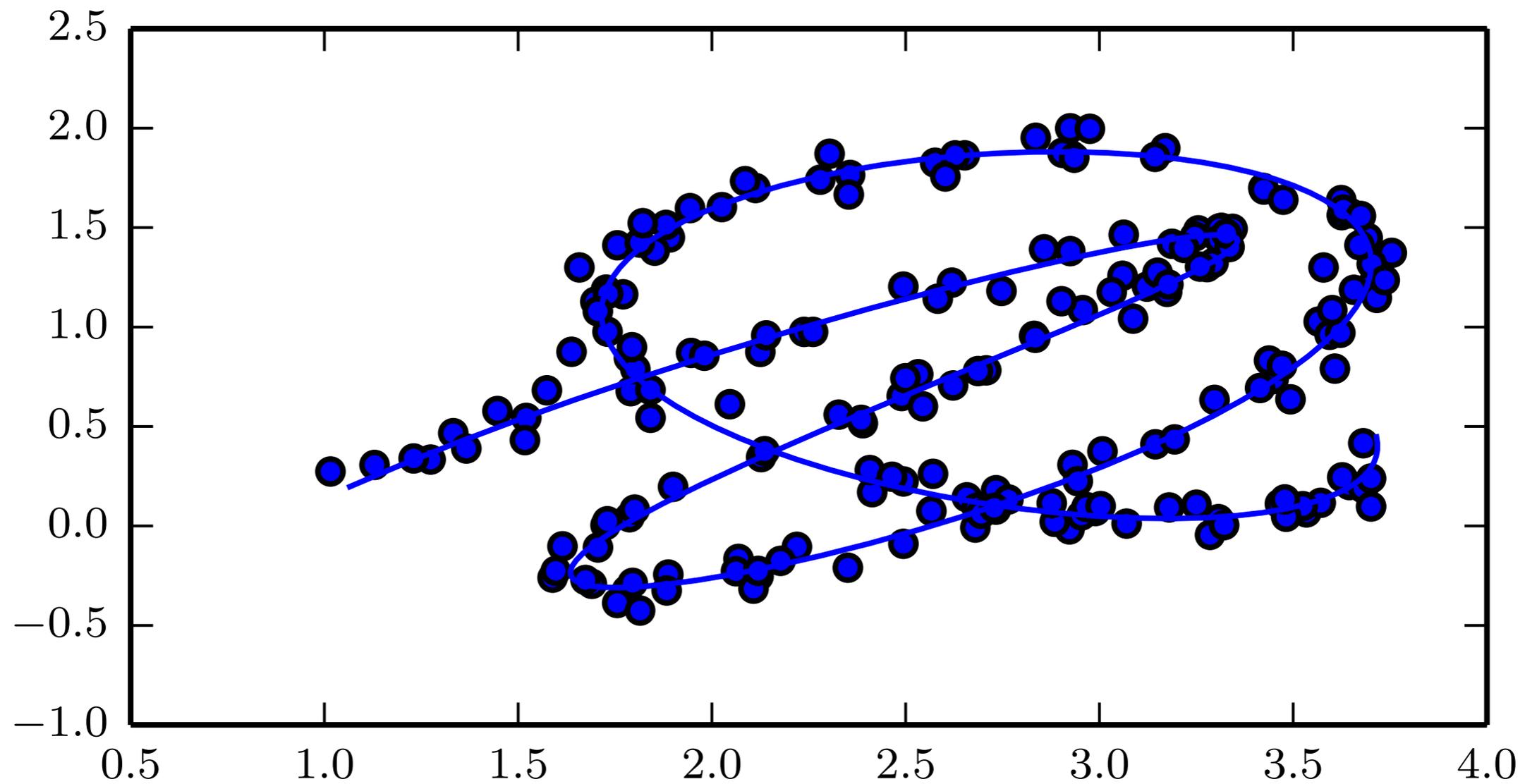


Figure 5.11

Uniformly Sampled Images

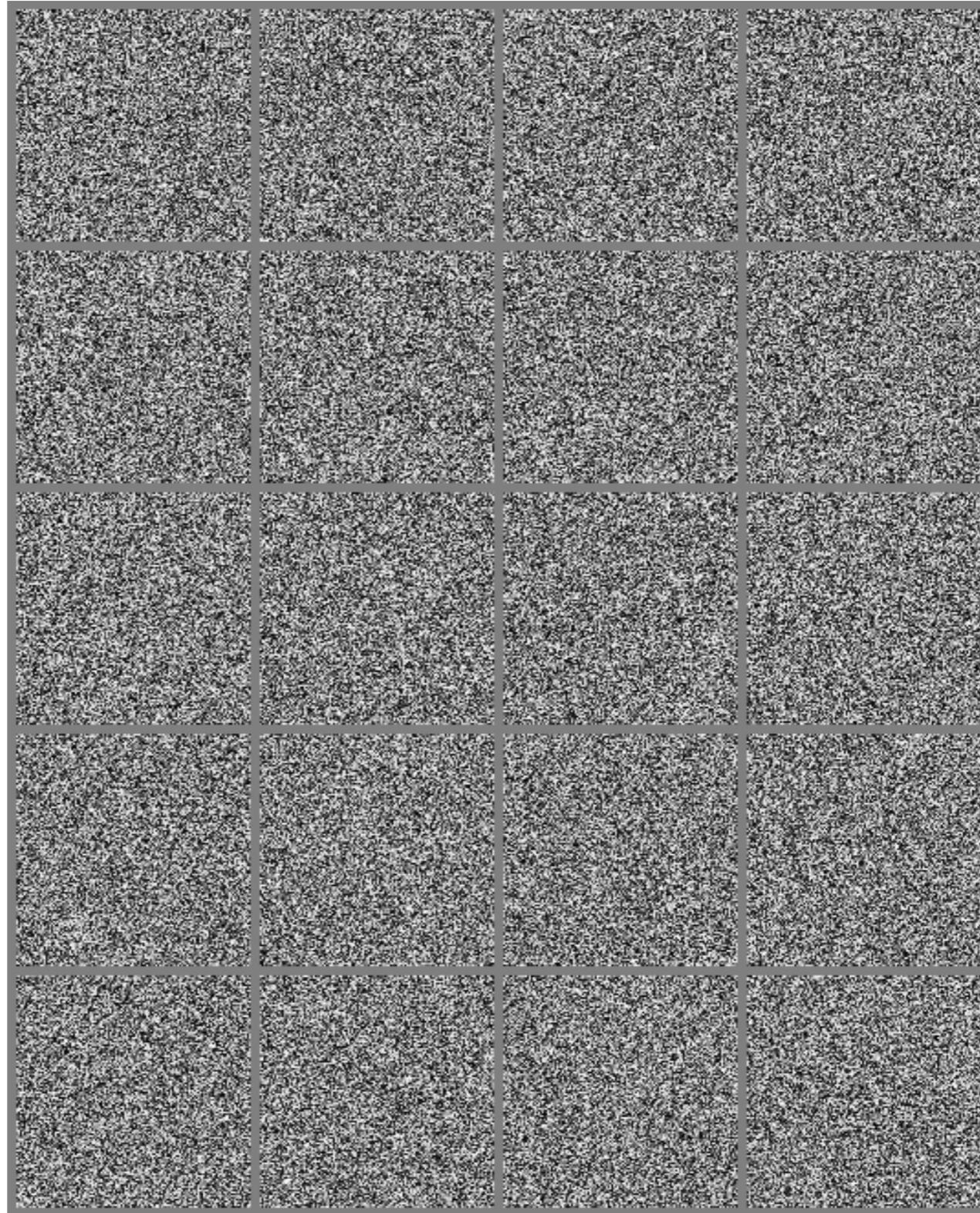


Figure 5.12

QMUL Dataset



Figure 5.13