## **Brief Contents**

1 Introduction

I	Foundations 29	
2	Probability: Univariate Models 31	
3	Probability: Multivariate Models 7	5
4	Statistics 103	
5	Decision Theory 163	
6	Information Theory 199	
7	Linear Algebra 221	
8	Optimization 269	
TT	Linear Models 315	Jearning
	Linear Discriminant Analysis 317	
10	Logistic Regression 333	
	Linear Regression 365	
12	Generalized Linear Models * 409	
	Golforalized Elliour Models	
TTT		117
Ш		417
13	Neural Networks for Structured Data	419
14	Neural Networks for Images 461	
15	Neural Networks for Sequences 49	7
IV	Nonparametric Models	539
16	Exemplar-based Methods 541	
17	Kernel Methods * 561	
18	Trees, Forests, Bagging, and Boosting	597

V	Beyond Supervised Learning	619
19	Learning with Fewer Labeled Examples	621
20	Dimensionality Reduction 651	
21	Clustering 709	
22	Recommender Systems 735	
23	Graph Embeddings * 747	
A	Notation 767	