1. Record Nr. UNINA9910818427003321

Autore	Kulkarni Sanjeev
Titolo	An elementary introduction to statistical learning theory / / Sanjeev Kulkarni, Gilbert Harman
Pubbl/distr/stampa	Hoboken, N.J., : Wiley, c2011
ISBN	9786613098689 9781283098687 1283098687 9781118023464 1118023463 9781118023471 1118023471 9781118023433 1118023439
Edizione	[1st ed.]
Descrizione fisica	1 online resource (235 p.)
Collana	Wiley series in probability and statistics
Classificazione	ST 300
Altri autori (Persone)	HarmanGilbert
Disciplina	006.3/1
Soggetti	Machine learning - Statistical methods Pattern recognition systems
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	An Elementary Introduction to Statistical Learning Theory; Contents; Preface; 1 Introduction: Classification, Learning, Features, and Applications; 1.1 Scope; 1.2 Why Machine Learning?; 1.3 Some Applications; 1.3.1 Image Recognition; 1.3.2 Speech Recognition; 1.3.3 Medical Diagnosis; 1.3.4 Statistical Arbitrage; 1.4 Measurements, Features, and Feature Vectors; 1.5 The Need for Probability; 1.6 Supervised Learning; 1.7 Summary; 1.8 Appendix: Induction; 1.9 Questions; 1.10 References; 2 Probability; 2.1 Probability of Some Basic Events; 2.2 Probabilities of Compound Events 2.3 Conditional Probability2.4 Drawing Without Replacement; 2.5 A Classic Birthday Problem; 2.6 Random Variables; 2.7 Expected Value; 2.8 Variance; 2.9 Summary; 2.10 Appendix: Interpretations of Probability; 2.11 Questions; 2.12 References; 3 Probability Densities; 3.1 An Example in Two Dimensions; 3.2 Random Numbers in [0,1]; 3.3

Density Functions; 3.4 Probability Densities in Higher Dimensions; 3.5 Joint and Conditional Densities; 3.6 Expected Value and Variance; 3.7 Laws of Large Numbers; 3.8 Summary; 3.9 Appendix: Measurability; 3.10 Questions; 3.11 References
4 The Pattern Recognition Problem4.1 A Simple Example; 4.2 Decision Rules; 4.3 Success Criterion; 4.4 The Best Classifier: Bayes Decision Rule; 4.5 Continuous Features and Densities; 4.6 Summary; 4.7 Appendix: Uncountably Many; 4.8 Questions; 4.9 References; 5 The Optimal Bayes Decision Rule; 5.1 Bayes Theorem; 5.2 Bayes Decision Rule; 5.3 Optimality and Some Comments; 5.4 An Example; 5.5 Bayes Theorem and Decision Rule with Densities; 5.6 Summary; 5.7 Appendix: Defining Conditional Probability; 5.8 Questions; 5.9 References; 6 Learning from Examples; 6.1 Lack of Knowledge of Distributions
6.2 Training Data6.3 Assumptions on the Training Data; 6.4 A Brute Force Approach to Learning; 6.5 Curse of Dimensionality, Inductive Bias, and No Free Lunch; 6.6 Summary; 6.7 Appendix: What Sort of Learning?; 6.8 Questions; 6.9 References; 7 The Nearest Neighbor Rule; 7.1 The Nearest Neighbor Rule; 7.2 Performance of the Nearest Neighbor Rule; 7.3 Intuition and Proof Sketch of Performance; 7.4 Using more Neighbors; 7.5 Summary; 7.6 Appendix: When People use Nearest Neighbor Reasoning; 7.6.1 Who Is a Bachelor?; 7.6.2 Legal Reasoning; 7.6.3 Moral Reasoning; 7.7 Questions; 7.8 References
8 Kernel Rules8.1 Motivation; 8.2 A Variation on Nearest Neighbor Rules; 8.3 Kernel Rules; 8.4 Universal Consistency of Kernel Rules; 8.5 Potential Functions; 8.6 More General Kernels; 8.7 Summary; 8.8 Appendix: Kernels, Similarity, and Features; 8.9 Questions; 8.10 References; 9 Neural Networks: Perceptrons; 9.1 Multilayer Feedforward Networks; 9.2 Neural Networks for Learning and Classification; 9.3 Perceptrons; 9.3.1 Threshold; 9.4 Learning Rule for Perceptrons; 9.5 Representational Capabilities of Perceptrons; 9.6 Summary; 9.7 Appendix: Models of Mind; 9.8 Questions; 9.9 References
10 Multilayer Networks

Sommario/riassunto

A thought-provoking look at statistical learning theory and its role in understanding human learning and inductive reasoning A joint endeavor from leading researchers in the fields of philosophy and electrical engineering, An Elementary Introduction to Statistical Learning Theory is a comprehensive and accessible primer on the rapidly evolving fields of statistical pattern recognition and statistical learning theory. Explaining these areas at a level and in a way that is not often found in other books on the topic, the authors present the basic theory behind contemporary ma