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Nota di contenuto	Contents ; Preface ; Chapter 1 Introduction ; 1.1 Multilayer perceptron neural networks ; 1.2 Regression and classification ; 1.3 Learning and generalization ; 1.3.1 Weight decay and effective number of parameters ; 1.3.2 Ridge regression ; 1.3.3 Bayesian learning 1.4 Principles of pattern recognition 1.4.1 Bayes rule and optimal classifier under Gaussian assumptions ; 1.4.2 Receiver operating characteristic ; 1.5 Dimensionality reduction methods ; 1.6 Parametric versus non-parametric approaches and RBF networks 1.7 Feedforward versus recurrent network models Chapter 2 Support Vector Machines ; 2.1 Maximal margin classification and linear SVMs ; 2.1.1 Margin ; 2.1.2 Linear SVM classifier: separable case ; 2.1.3 Linear SVM classifier: non-separable case ; 2.2 Kernel trick and Mercer condition 2.3 Nonlinear SVM classifiers 2.4 VC theory and structural risk minimization ; 2.4.1 Empirical risk versus generalization error

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2.5.2 SVM for nonlinear function estimation
2.5.3 VC bound on generalization error ;
2.6 Modifications and extensions ; 2.6.1 Kernels ; 2.6.2 Extension to other convex cost functions ; 2.6.3 Algorithms ; 2.6.4 Parametric versus non-parametric approaches
Chapter 3 Basic Methods of Least Squares Support Vector Machines

Sommario/riassunto

This book focuses on Least Squares Support Vector Machines (LS-SVMs) which are reformulations to standard SVMs. LS-SVMs are closely related to regularization networks and Gaussian processes but additionally emphasize and exploit primal-dual interpretations from optimization theory. The authors explain the natural links between LS-SVM classifiers and kernel Fisher discriminant analysis. Bayesian inference of LS-SVM models is discussed, together with methods for imposing sparseness and employing robust statistics. The framework is further extended towards unsupervised learning by considering P