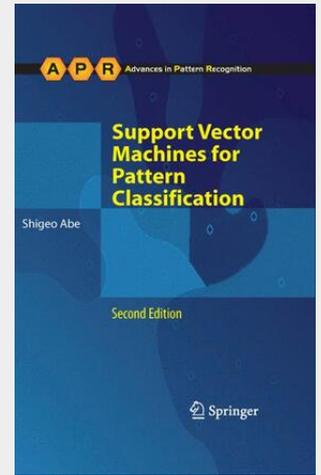


## Support Vector Machines for Pattern Classification

A guide on the use of SVMs in pattern classification, including a rigorous performance comparison of classifiers and regressors. The book presents architectures for multiclass classification and function approximation problems, as well as evaluation criteria for classifiers and regressors. Features: Clarifies the characteristics of two-class SVMs; Discusses kernel methods for improving the generalization ability of neural networks and fuzzy systems; Contains ample illustrations and examples; Includes performance evaluation using publicly available data sets; Examines Mahalanobis kernels, empirical feature space, and the effect of model selection by cross-validation; Covers sparse SVMs, learning using privileged information, semi-supervised learning, multiple classifier systems, and multiple kernel learning; Explores incremental training based batch training and active-set training methods, and decomposition techniques for linear programming SVMs; Discusses variable selection for support vector regressors.

Originally formulated for two-class classification problems, support vector machines (SVMs) are now accepted as powerful tools for developing pattern classification and function approximation systems. Recent developments in kernel-based methods include kernel classifiers and regressors and their variants, advancements in generalization theory, and various feature selection and extraction methods. Providing a unique perspective on the state of the art in SVMs, with a particular focus on classification, this thoroughly updated new edition includes a more rigorous performance comparison of classifiers and regressors. In addition to presenting various useful architectures for multiclass classification and function approximation problems, the book now also investigates evaluation criteria for classifiers and regressors. Topics and Features: - Clarifies the characteristics of two-class SVMs through extensive analysis - Discusses kernel methods for improving the generalization ability of conventional neural networks and fuzzy systems - Contains ample illustrations, examples and computer experiments to help readers understand the concepts and their usefulness - Includes performance evaluation using publicly available two-class data sets, microarray sets, multiclass data sets, and regression data sets (NEW) - Examines Mahalanobis kernels, empirical feature space, and the effect of model selection by cross-validation (NEW) - Covers sparse SVMs, an approach to learning using privileged information, semi-supervised learning, multiple classifier systems, and multiple kernel learning (NEW) - Explores incremental training based batch training and active-set training methods, together with decomposition techniques for linear programming SVMs (NEW) - Provides a discussion on variable selection for support vector regressors (NEW) An essential guide on the use of SVMs in pattern classification, this comprehensive resource will be of interest to researchers and postgraduate students, as well as professional developers. Dr. Shigeo Abe is a Professor at Kobe University, Graduate School of Engineering. He is the author of the Springer titles Neural Networks and Fuzzy Systems and Pattern Classification: Neuro-fuzzy Methods and Their Comparison.



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