Contents

Preface ...................................................................................... V

Part I. Clustering and Discrimination

Clustering .................................................................................. 3

Some Thoughts about Classification ........................................ 5
   Frank Hampel

Partial Defuzzification of Fuzzy Clusters .................................... 27
   Slavka Bodjanova

A New Clustering Approach, Based on the Estimation of the
Probability Density Function, for Gene Expression Data .......... 35
   Noël Bonnet, Michel Herbin, Jérôme Cutrona, Jean-Marie Zahn

Two-mode Partitioning: Review of Methods and Application
of Tabu Search ........................................................................... 43
   William Castillo, Javier Trejos

Dynamical Clustering of Interval Data Optimization .................. 53
   Marie Chavent, Yves Lechevallier

Removing Separation Conditions in a 1 against 3-Components
Gaussian Mixture Problem ........................................................... 61
   Bernard Garel and Franck Goussanou

Obtaining Partitions of a Set of Hard or Fuzzy Partitions .......... 75
   Allan D. Gordon, Maurizio Vichi

Clustering for Prototype Selection using Singular Value De-
composition .............................................................................. 81
   A.K.V.Sai Jayram, M.Narasimha Murty

Clustering in High-dimensional Data Spaces ............................. 89
   Fionn Murtagh

Quantization of Models: Local Approach and Asymptotically
Optimal Partitions ...................................................................... 97
   Klaus Pötzelberger
The Performance of an Autonomous Clustering Technique.... 107
Yoshiharu Sato

Cluster Analysis with Restricted Random Walks ............... 113
Joachim Schöll, Elisabeth Paschinger

Missing Data in Hierarchical Classification of Variables —
a Simulation Study ........................................ 121
Ana Lorga da Silva, Helena Bacelar-Nicolau, Gilbert Saporta

Cluster Validation .............................................. 130

Representation and Evaluation of Partitions ............. 131
Alain Guénoche, Henri Garreta

Assessing the Number of Clusters of the Latent Class Model . 139
François-Xavier Jollois, Mohamed Nadif and Gérard Govaert

Validation of Very Large Data Sets Clustering by Means of a
Nonparametric Linear Criterion ............................ 147
Israel Lerman, Joaquim Pinto da Costa, Helena Silva

Discrimination .................................................. 160

Effect of Feature Selection on Bagging Classifiers Based on
Kernel Density Estimators .................................... 161
Edgar Acuña, Alex Rojas, Frida Coaquirá

Biplot Methodology for Discriminant Analysis Based upon
Robust Methods and Principal Curves ........................ 169
Sugnet Gardner, Niel le Roux

Bagging Combined Classifiers ................................ 177
Torsten Hothorn and Berthold Lausen

Application of Bayesian Decision Theory to Constrained Classi-
Fication Networks ............................................. 185
Hans J. Vos

Part II. Multivariate Data Analysis and Statistics

Multivariate Data Analysis .................................... 194

Quotient Dissimilarities, Euclidean Embeddability, and Huy-
gens' Weak Principle ....................................... 195
François Bavaud
Conjoint Analysis and Stimulus Presentation
- a Comparison of Alternative Methods .................. 203
  Michael Brusch, Daniel Baier, Antje Treppa

Grade Correspondence-cluster Analysis Applied to Separate Components of Reversely Regular Mixtures ............ 211
  Alicja Ciok

Obtaining Reducts with a Genetic Algorithm ............ 219
  José Luis Espinoza

A Projection Algorithm for Regression with Collinearity .... 227
  Peter Filzmoser, Christophe Croux

Confronting Data Analysis with Constructivist Philosophy ... 235
  Christian Hennig

Statistical Methods .......................................... 246

Maximum Likelihood Clustering with Outliers ............. 247
  María Teresa Gallegos

An Improved Method for Estimating the Modes of the Probability Density Function and the Number of Classes for PDF-based Clustering ........................................... 257
  Michel Herbin, Noel Bonnet

Maximization of Measure of Allowable Sample Sizes Region in Stratified Sampling .............................. 263
  Marcin Skibicki

On Estimation of Population Averages on the Basis of Cluster Sample ........................................... 271
  Janusz Wywiał

Symbolic Data Analysis ....................................... 280

Symbolic Regression Analysis ............................... 281
  Lynne Billard, Edwin Diday

Modelling Memory Requirement with Normal Symbolic Form 289
  Marc Csernel, Francisco de A. T. de Carvalho

Mixture Decomposition of Distributions by Copulas ....... 297
  Edwin Diday

Determination of the Number of Clusters for Symbolic Objects Described by Interval Variables ................... 311
  André Hardy, Pascale Lallemand
Symbolic Data Analysis Approach to Clustering Large Datasets .................................................. 319
   Simona Korenjak-Černe, Vladimir Batagelj

Symbolic Class Descriptions ............................................. 329
   Mathieu Vrac, Edwin Diday, Suzanne Winsberg, Mohamed Mehdi Limam

Consensus Trees and Phylogenetics ..................................... 340

A Comparison of Alternative Methods for Detecting Reticulation Events in Phylogenetic Analysis ................. 341
   Olivier Gauthier, François-Joseph Lapointe

Hierarchical Clustering of Multiple Decision Trees .................. 349
   Branko Kavšek, Nada Lavrač, Anuška Ferligoj

Multiple Consensus Trees .................................................. 359
   François-Joseph Lapointe, Guy Cucumel

A Family of Average Consensus Methods for Weighted Trees .... 365
   Claudine Levasseur, François-Joseph Lapointe

Comparison of Four methods for Inferring Additive Trees from Incomplete Dissimilarity Matrices ....................... 371
   Vladimir Makarenkov

Quartet Trees as a Tool to Reconstruct Large Trees from Sequences ................................................... 379
   Heiko A. Schmidt, Arndt von Haeseler

Regression Trees ........................................................... 390

Regression Trees for Longitudinal Data with Time-dependent Covariates .................................................. 391
   Giuliano Galimberti, Angela Montanari

Tree-based Models in Statistics: Three Decades of Research .... 399
   Eugeniusz Gatnar

Computationally Efficient Linear Regression Trees ................ 409
   Luis Torgo

Neural Networks and Genetic Algorithms ................................ 418

A Clustering Based Procedure for Learning the Hidden Unit Parameters in Elliptical Basis Function Networks .......... 419
   Marilena Pillati, Daniela G. Calò
Multi-layer Perceptron on Interval Data ......................... 427
  Fabrice Rossi, Brieuc Conan-Guez

Part III. Applications

Textual Analysis of Customer Statements for Quality Control and Help Desk Support ........................................ 437
  Ulrich Bohnacker, Lars Dehning, Jürgen Franke, Ingrid Renz

AHP as Support for Strategy Decision Making in Banking ... 447
  Czesław Domański, Jarosław Kondrasiuk

Bioinformatics and Classification: The Analysis of Genome Expression Data .................................................. 455
  Berthold Lausen

Glaucoma Diagnosis by Indirect Classifiers .......................... 463
  Andrea Peters, Torsten Hothorn, Berthold Lausen

A Cluster Analysis of the Importance of Country and Sector on Company Returns ...................................... 471
  Clifford W. Sell

Problems of Classification in Investigative Psychology ...... 479
  Paul J. Taylor, Craig Bennell, Brent Snook

List of Reviewers ....................................................... 489

Index ................................................................. 491
Classification, Clustering, and Data Analysis
Recent Advances and Applications
Jajuga, K.; Sokolowski, A.; Bock, H.-H. (Eds.)
2002, XI, 508 p. 20 illus., Softcover
ISBN: 978-3-540-43691-1