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Nota di contenuto	Mixtures: Estimation and Applications; Contents; Preface; Acknowledgements; List of contributors; 1 The EM algorithm, variational approximations and expectation propagation for mixtures; 1.1 Preamble; 1.2 The EM algorithm; 1.2.1 Introduction to the algorithm; 1.2.2 The E-step and the M-step for the mixing weights; 1.2.3 The M-step for mixtures of univariate Gaussian distributions; 1.2.4 M-step for mixtures of regular exponential family distributions formulated in terms of the natural parameters; 1.2.5 Application to other mixtures; 1.2.6 EM as a double expectation 1.3 Variational approximations1.3.1 Preamble; 1.3.2 Introduction to variational approximations; 1.3.3 Application of variational Bayes to mixture problems; 1.3.4 Application to other mixture problems; 1.3.5 Recursive variational approximations; 1.3.6 Asymptotic results; 1.4 Expectation-propagation; 1.4.1 Introduction; 1.4.2 Overview of the recursive approach to be adopted; 1.4.3 Finite Gaussian mixtures with an unknown mean parameter; 1.4.4 Mixture of two known distributions; 1.4.5 Discussion; Acknowledgements; References; 2

Online expectation maximisation; 2.1 Introduction
 2.2 Model and assumptions 2.3 The EM algorithm and the limiting EM recursion; 2.3.1 The batch EM algorithm; 2.3.2 The limiting EM recursion; 2.3.3 Limitations of batch EM for long data records; 2.4 Online expectation maximisation; 2.4.1 The algorithm; 2.4.2 Convergence properties; 2.4.3 Application to finite mixtures; 2.4.4 Use for batch maximum-likelihood estimation; 2.5 Discussion; References;
 3 The limiting distribution of the EM test of the order of a finite mixture; 3.1 Introduction; 3.2 The method and theory of the EM test; 3.2.1 The definition of the EM test statistic 3.2.2 The limiting distribution of the EM test statistic 3.3 Proofs; 3.4 Discussion; References; 4 Comparing Wald and likelihood regions applied to locally identifiable mixture models; 4.1 Introduction; 4.2 Background on likelihood confidence regions; 4.2.1 Likelihood regions; 4.2.2 Profile likelihood regions; 4.2.3 Alternative methods; 4.3 Background on simulation and visualisation of the likelihood regions; 4.3.1 Modal simulation method; 4.3.2 Illustrative example; 4.4 Comparison between the likelihood regions and the Wald regions; 4.4.1 Volume/volume error of the confidence regions 4.4.2 Differences in univariate intervals via worst case analysis 4.4.3 Illustrative example (revisited); 4.5 Application to a finite mixture model; 4.5.1 Nonidentifiabilities and likelihood regions for the mixture parameters; 4.5.2 Mixture likelihood region simulation and visualisation; 4.5.3 Adequacy of using the Wald confidence region; 4.6 Data analysis; 4.7 Discussion; References; 5 Mixture of experts modelling with social science applications; 5.1 Introduction; 5.2 Motivating examples; 5.2.1 Voting blocs; 5.2.2 Social and organisational structure; 5.3 Mixture models 5.4 Mixture of experts models

Sommario/riassunto

This book uses the EM (expectation maximization) algorithm to simultaneously estimate the missing data and unknown parameter(s) associated with a data set. The parameters describe the component distributions of the mixture; the distributions may be continuous or discrete. The editors provide a complete account of the applications, mathematical structure and statistical analysis of finite mixture distributions along with MCMC computational methods, together with a range of detailed discussions covering the applications of the methods and features chapters from the leading experts on the subje