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Edizione	[1st ed.]
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Collana	Chapman & Hall/CRC handbooks of modern statistical methods
Altri autori (Persone)	Fruhwirth-SchnatterSylvia <1959-> CeleuxGilles RobertChristian P. <1961->
Disciplina	519.24
Soggetti	Mixture distributions (Probability theory) Distribution (Probability theory)
Lingua di pubblicazione	Inglese
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Note generali	Description based upon print version of record. 5.4.1 Known number of components
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Nota di contenuto	Cover; Half Title; Title Page; Copyright Page; Table of Contents; Preface; Editors; Contributors; List of Symbols; I: Foundations and Methods; 1: Introduction to Finite Mixtures; 1.1 Introduction and Motivation; 1.1.1 Basic formulation; 1.1.2 Likelihood; 1.1.3 Latent allocation variables; 1.1.4 A little history; 1.2 Generalizations; 1.2.1 Infinite mixtures; 1.2.2 Continuous mixtures; 1.2.3 Finite mixtures with nonparametric components; 1.2.4 Covariates and mixtures of experts; 1.2.5 Hidden Markov models; 1.2.6 Spatial mixtures; 1.3 Some Technical Concerns; 1.3.1 Identifiability 1.3.2 Label switching1.4 Inference; 1.4.1 Frequentist inference, and the role of EM; 1.4.2 Bayesian inference, and the role of MCMC; 1.4.3 Variable number of components; 1.4.4 Modes versus components; 1.4.5 Clustering and classification; 1.5 Concluding Remarks; Bibliography; 2: EM Methods for Finite Mixtures; 2.1 Introduction; 2.2 The EM Algorithm; 2.2.1 Description of EM for finite mixtures; 2.2.2 EM as an alternating-maximization algorithm; 2.3 Convergence and Behavior of EM; 2.4 Cousin Algorithms of EM; 2.4.1 Stochastic versions

of the EM algorithm; 2.4.2 The Classification EM algorithm
2.5 Accelerating the EM Algorithm
2.6 Initializing the EM Algorithm;
2.6.1 Random initialization; 2.6.2 Hierarchical initialization; 2.6.3
Recursive initialization; 2.7 Avoiding Spurious Local Maximizers; 2.8
Concluding Remarks; Bibliography; 3: An Expansive View of EM
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3.2.1 Iterative algorithms and the ascent property; 3.2.2 Creating a
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3.5 Stopping Rules for EM Algorithms
3.6 Concluding Remarks;
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4.2.2.1 Conjugate priors; 4.2.2.2 Improper and non-informative priors;
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Monte Carlo; 5.2.6 Nested sampling; 5.3 Bayesian Inference in the
Model-Based Clustering Context; 5.4 Simulation Studies

Sommario/riassunto

Mixture models have been around for over 150 years, and they are found in many branches of statistical modelling, as a versatile and multifaceted tool. They can be applied to a wide range of data: univariate or multivariate, continuous or categorical, cross-sectional, time series, networks, and much more. Mixture analysis is a very active research topic in statistics and machine learning, with new developments in methodology and applications taking place all the time. The Handbook of Mixture Analysis is a very timely publication, presenting a broad overview of the methods and applications of this important field of research. It covers a wide array of topics, including the EM algorithm, Bayesian mixture models, model-based clustering, high-dimensional data, hidden Markov models, and applications in finance, genomics, and astronomy. Features: Provides a comprehensive overview of the methods and applications of mixture modelling and analysis Divided into three parts: Foundations and Methods; Mixture Modelling and Extensions; and Selected Applications Contains many worked examples using real data, together with computational implementation, to illustrate the methods described Includes contributions from the leading researchers in the field The Handbook of Mixture Analysis is targeted at graduate students and young researchers new to the field. It will also be an important reference for anyone working in this field, whether they are developing new methodology, or applying the models to real scientific problems.
