

The only single-source—now completely updated and revised—to offer a unified treatment of the theory, methodology, and applications of the EM algorithm

Complete with updates that capture developments from the past decade, *The EM Algorithm and Extensions, Second Edition* successfully provides a basic understanding of the EM algorithm by describing its inception, implementation, and applicability in numerous statistical contexts. In conjunction with the fundamentals of the topic, the authors discuss convergence issues and computation of standard errors, and, in addition, unveil many parallels and connections between the EM algorithm and Markov chain Monte Carlo algorithms. Thorough discussions on the complexities and drawbacks that arise from the basic EM algorithm, such as slow convergence and lack of an in-built procedure to compute the covariance matrix of parameter estimates, are also presented.

While the general philosophy of the *First Edition* has been maintained, this timely new edition has been updated, revised, and expanded to include:

- New chapters on Monte Carlo versions of the EM algorithm and generalizations of the EM algorithm
- New results on convergence, including convergence of the EM algorithm in constrained parameter spaces
- Expanded discussion of standard error computation methods, such as methods for categorical data and methods based on numerical differentiation
- Coverage of the interval EM, which locates all stationary points in a designated region of the parameter space
- Exploration of the EM algorithm's relationship with the Gibbs sampler and other Markov chain Monte Carlo methods
- Plentiful pedagogical elements—chapter introductions, lists of examples, author and subject indices, computer-drawn graphics, and a related Web site

The EM Algorithm and Extensions, Second Edition serves as an excellent text for graduate-level statistics students and is also a comprehensive resource for theoreticians, practitioners, and researchers in the social and physical sciences who would like to extend their knowledge of the EM algorithm.

GEOFFREY J. McLACHLAN, PhD, DSc, is Professor of Statistics in the Department of Mathematics at The University of Queensland, Australia. A Fellow of the American Statistical Association and the Australian Mathematical Society, he has published extensively on his research interests, which include cluster and discriminant analyses, image analysis, machine learning, neural networks, and pattern recognition. Dr. McLachlan is the author or coauthor of *Analyzing Microarray Gene Expression Data*, *Finite Mixture Models*, and *Discriminant Analysis and Statistical Pattern Recognition*, all published by Wiley.

THRIYAMBAKAM KRISHNAN, PhD, is Chief Statistical Architect, SYSTAT Software at Cranes Software International Limited in Bangalore, India. Dr. Krishnan has over forty-five years of research, teaching, consulting, and software development experience at the Indian Statistical Institute (ISI). His research interests include biostatistics, image analysis, pattern recognition, psychometry, and the EM algorithm.

Subscribe to our free Statistics eNewsletter at www.wiley.com/enewsletters

Visit www.wiley.com/statistics



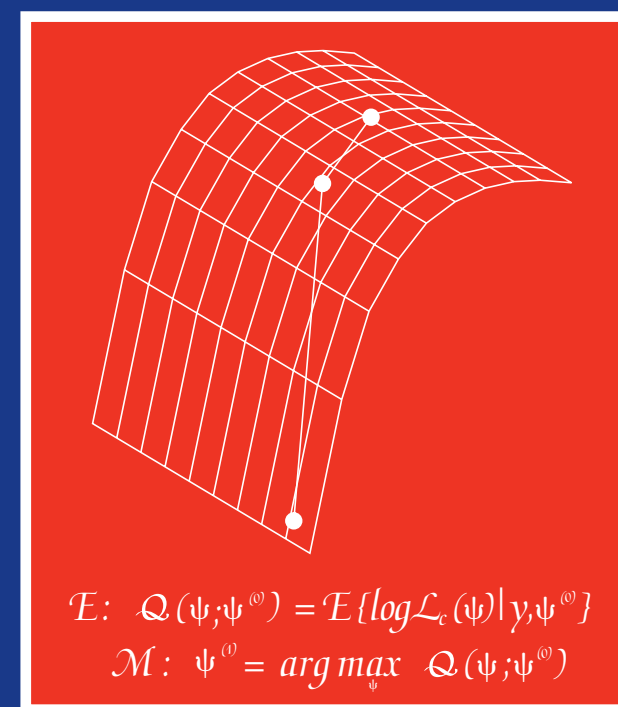
McLachlan
Krishnan

The EM Algorithm and Extensions

Second Edition

The EM Algorithm and Extensions

Second Edition



Geoffrey J. McLachlan
Thriyambakam Krishnan

WILEY SERIES IN PROBABILITY AND STATISTICS