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Maximum smoothed likelihood for multivariate mixtures. (English) Zbl 1215.62055

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Summary: We introduce an algorithm for estimating the parameters in a finite mixture of completely unspecified multivariate components in at least three dimensions under the assumption of conditionally independent coordinate dimensions. We prove that this algorithm, based on a majorization-minimization idea, possesses a desirable descent property just as any EM algorithm does. We discuss the similarities between our algorithm and a related one, the so-called nonlinearly smoothed EM algorithm for the non-mixture setting. We also demonstrate via simulation studies that the new algorithm gives very similar results to another algorithm that has been shown empirically to be effective but that does not satisfy any descent property. We provide code for implementing the new algorithm in a publicly available R package.

MSC:

[62H12](#) Estimation in multivariate analysis

[62G05](#) Nonparametric estimation

[65C60](#) Computational problems in statistics (MSC2010)

Cited in **16** Documents

Keywords:

EM algorithm; majorization-minimization algorithm; nonlinearly smoothed EM algorithm; nonparametric mixture

Software:

[mixtools](#); [R](#)

Full Text: [DOI](#)