ROBUST ESTIMATION OF k-COMPONENT UNIVARIATE NORMAL MIXTURES

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Abstract. The estimating equations derived from minimising a L_2 distance between the empirical distribution function and the parametric distribution representing a mixture of k normal distributions with possibly different means and/or different dispersion parameters are given explicitly. The equations are of the M estimator form in which the ψ function is smooth, bounded and has bounded partial derivatives. As a consequence it is shown that there is a solution of the equations which is robust. In particular there exists a weakly continuous, Fréchet differentiable root and hence there is a consistent root of the equations which is asymptotically normal. These estimating equations offer a robust alternative to the maximum likelihood equations, which are known to yield nonrobust estimators.

Key words and phrases: Influence function, weak continuity, mixtures of normals, Fréchet differentiability, consistency, asymptotic normality, selection functional, minimum distance estimator.