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Estimation of a Two Component Symmetric Mixture Model

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We consider a sample of i.i.d. random variables $X = (\eta_1, \dots, \eta_N)$ with probability density function

$$f_\eta = pf(x - a_1) + (1 - p)f(x - a_2).$$

Function f is a symmetric density function, $p \in (0, 1/2)$, a_1 and a_2 are real not random numbers. Values p, a_1, a_2 as well as function f are unknown. Such mixture model is known to be identifiable. Additionally we assume that density f is a mixture of gaussian distributions. Basing on estimators for parametric part of this model, given in [1], we propose an estimator for f that is shown to be strongly consistent. We also consider the EM-algorithm for this model and present the explicit result of each step of the EM-algorithm.

- [1] R. Maiboroda. Estimation of mean positions and concentrations from observations of a two-component mixture of symmetric distributions. *Theory of Probability and Mathematical Statistics* **78**, (2008), p. 133-141.