

# **Maximum likelihood estimation for mixtures of skew Student-t-normal distributions through practical EM-type algorithms**

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The problem of maximum likelihood estimation for a mixture of skew Student-t-normal distributions is considered. That is a novel model-based tool for clustering heterogeneous data in the presence of skewed and heavy-tailed observations. We present analytically simple EM-type algorithms for iteratively computing the maximum likelihood estimates. A small simulation study is conducted to demonstrate the superiority of the skew Student-t-normal distribution compared to the skew t distribution. To determine an optimal number of components for the proposed mixture models, a greedy EM algorithm was applied. We illustrate the approach with a real data set obtained by flow cytometry.

Key Words: ECM algorithm, Flow cytometry, ST mixtures, STN mixtures