

# On Contaminated Transformation Mixture Models

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For many decades, Gaussian mixture models have been the most popular mixtures in literature. However, the adequacy of the fit provided by Gaussian components is often in question due to the presence of skewness or heavy tails. Various distributions capable of modeling these features have been considered in the mixture modeling context recently. We introduce a contaminated transformation mixture model that is constructed based on the idea of transformation to symmetry [1, 2]. The proposed mixture can effectively account for skewness, heavy tails, and automatically detect scatter by assigning such data points to secondary mixture components. The performance and promise of the proposed model is illustrated on synthetic data in various settings as well as popular classification data sets.

- [1] Y. Melnykov, X. Zhu, and V. Melnykov, “Transformation mixture modeling for skewed data groups with heavy tails and scatter,” *Computational Statistics*, vol. 36, pp. 61–78, 2021.
- [2] X. Zhu and V. Melnykov, “Manly transformation in finite mixture modeling,” *Computational Statistics & Data Analysis*, vol. 121, pp. 190–208, 2018.