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Ankit Pensia, Varun Jog and Po-Ling Loh* (ploh@stat.wisc.edu). *Mean estimation for entangled single-sample distributions.*

We consider the problem of estimating the common mean of univariate data, when independent samples are drawn from non-identical symmetric, unimodal distributions. This captures the setting where all samples are Gaussian with different unknown variances. We propose an estimator that adapts to the level of heterogeneity in the data, achieving near-optimality in both the i.i.d. setting and some heterogeneous settings, where the fraction of “low-noise” points is as small as $\log n$. Our estimator is a hybrid of the modal interval, shorth, and median estimators from classical statistics. The rates depend on the percentile of the mixture distribution, making our estimators useful even for distributions with infinite variance. (Received August 16, 2019)