

Robust estimations of moments for unimodal distributions

Tuban Lee

This manuscript was compiled on June 9, 2023

1 **A. Invariant Moments.** All popular robust location estimators,
2 such as the symmetric trimmed mean, symmetric Winsorized
3 mean, Hodges-Lehmann estimator, Huber M -estimator, and
4 median of means, are symmetric. As shown previously, a
5 γ -weighted Hodges-Lehmann mean ($\text{WHLM}_{k,\epsilon,\gamma}$) can achieve
6 consistency for the population mean in any γ -symmetric dis-
7 tribution with a finite mean. However, it falls considerably
8 short of consistently handling other parametric distributions.

DRAFT