Near-consistent robust estimations of moments for unimodal distributions

Tuban Lee

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Descriptive statistics for parametric models currently rely heavily on the accuracy of distributional assumptions. Here, leveraging the structures of parametric distributions and their central moment kernel distributions, a class of estimators, consistent simultaneously for both a semiparametric distribution and a distinct parametric distribution, is proposed. These estimators are robust to both gross errors and departures from parametric assumptions, demonstrating excellent performance for estimating the mean and central moments in common unimodal distributions.

Theorem .1.

Proof. □