

# Near-consistent robust estimations of moments for unimodal distributions

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This manuscript was compiled on June 4, 2023

1 Descriptive statistics for parametric models currently heavily rely  
2 on the accuracy of distributional assumptions. Here, leveraging the  
3 structures of unimodal distributions and their central moment kernel  
4 distributions, a series of sophisticated yet efficient estimators, robust  
5 to both gross errors and departures from parametric assumptions, are  
6 proposed for estimating mean and central moments for common uni-  
7 modal distributions. This article also illuminates the understanding  
8 of the common nature of probability distributions and the measures  
9 of them.

orderliness | invariant | unimodal | adaptive estimation |  $U$ -statistics

1 Theorem .1.

2 *Proof.*

□

3 **Data Availability.** Data for Table ?? are given in SI Dataset S1.

4 All codes have been deposited in [GitHub](#).

5 **ACKNOWLEDGMENTS.** I gratefully acknowledge the construc-  
6 tive comments made by the editor which substantially improved  
7 the clarity and quality of this paper.