

Semiparametric robust mean estimations based on the orderliness of quantile averages

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semiparametric | mean-median-mode inequality | asymptotic | unimodal
| Hodges–Lehmann estimator

Furthermore, for weighted averages, separating the breakdown point into upper and lower parts is necessary.

Definition .1 (Upper/lower breakdown point). The upper breakdown point is the breakdown point generalized in Davies and Gather (2005)’s paper (?). The finite-sample upper breakdown point is the finite sample breakdown point defined by Donoho and Huber (1983) (1) and also detailed in (?). The (finite-sample) lower breakdown point is replacing the infinity symbol in these definitions with negative infinity.

Classifying Distributions by the Signs of Derivatives

Let $\mathcal{P}_{\mathbb{R}}$ denote the set of all continuous distributions over \mathbb{R} and $\mathcal{P}_{\mathbb{X}}$ denote the set of all discrete distributions over a countable set \mathbb{X} . The default of this article will be on the class of continuous distributions, $\mathcal{P}_{\mathbb{R}}$.

Data Availability. Data for Figure ?? are given in SI Dataset S1. All codes have been deposited in [GitHub](#).

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1. DL Donoho, PJ Huber, The notion of breakdown point. *A festschrift for Erich L. Lehmann* 157184 (1983).