Accounting for Bias in Extreme Value Index Estimation: Applications in Environmental Science

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Talk Abstract

The field of Extreme Value Statistics primarily focuses on estimating parameters related to extreme events, such as the probability of surpassing a high threshold or an extreme quantile. The estimation of the extreme value index (EVI) holds significant importance within this field, offering crucial insights into distribution tail behavior. The Hill estimators [1] are commonly utilized methods for EVI estimation, particularly in models featuring an EVI > 0 (heavy tails). However, the susceptibility of these estimators to bias poses a challenge, potentially leading to inaccuracies in EVI estimations. Such inaccuracies can significantly impact the reliability of risk assessments and decision-making processes. To address this issue, this paper proposes a new reduced-bias EVI-estimator, in the lines of [2], based on a particular generalized mean [3] and in the recent work [4]. The methodology will be applied to several sets of real environmental data and to simulated data for validation.

Keywords: statistics of extremes, reduced bias estimators, extreme value index, environmental data.

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