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Tests of concentration for low-dimensional and high-dimensional directional data. (English)

Zbl 1381.62088

Ahmed, S. Ejaz (ed.), Big and complex data analysis. Methodologies and applications. Cham: Springer (ISBN 978-3-319-41572-7/hbk; 978-3-319-41573-4/ebook). Contributions to Statistics, 209-227 (2017).

Summary: We consider asymptotic inference for the concentration of directional data. More precisely, we propose tests for concentration (1) in the low-dimensional case where the sample size n goes to infinity and the dimension p remains fixed, and (2) in the high-dimensional case where both n and p become arbitrarily large. To the best of our knowledge, the tests we provide are the first procedures for concentration that are valid in the (n, p) -asymptotic framework. Throughout, we consider parametric FvML tests, that are guaranteed to meet asymptotically the nominal level constraint under FvML distributions only, as well as “pseudo-FvML” versions of such tests, that meet asymptotically the nominal level constraint within the whole class of rotationally symmetric distributions. We conduct a Monte-Carlo study to check our asymptotic results and to investigate the finite-sample behavior of the proposed tests.

For the entire collection see [Zbl 1392.62007].

MSC:

- 62H11 Directional data; spatial statistics
- 62G20 Asymptotic properties of nonparametric inference
- 60E05 Probability distributions: general theory
- 62F03 Parametric hypothesis testing

Cited in 1 Document

Keywords:

directional data; asymptotic inference; Fisher von Mises-Langevin (FvML) distributions

Full Text: DOI