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## Goodness-of-Fit Tests via Entropy-Based Density Estimation Techniques

### Communication Info

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### Abstract

Goodness-of-fit testing remains a fundamental problem in statistical inference with broad practical importance [1]. In this talk, we introduce two new goodness-of-fit tests grounded in entropy-based density estimation techniques [2, 3]. The first is a boundary-corrected empirical likelihood ratio test, which refines the classic approach by addressing bias near the support boundaries, though, in practice, it yields results very similar to the uncorrected version [4]. The second is a novel test built on Correa's local linear entropy estimator, leveraging quantile regression to improve density estimation accuracy [5]. We establish the theoretical properties of both test statistics and demonstrate their practical effectiveness through extensive simulation studies and real-data applications. The results show that the proposed methods deliver strong power and flexibility in assessing model adequacy in a wide range of settings.

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### References

- [1] Lehmann, E. L.; Romano, J. P., *Testing Statistical Hypotheses*, Springer, 2022, pp. 1–786.
- [2] Vasicek, O., A test for normality based on sample entropy, *Journal of the Royal Statistical Society: Series B (Methodological)*, 38, 1976, 54–59.
- [3] Al-Labadi, L.; Chu, Z.; Xu, Y., Advancements in Rényi entropy and divergence estimation for model assessment, *Computational Statistics*, 40, 2025, 633–650.
- [4] Ebrahimi, N.; Pflughoeft, K.; Soofi, E. S., Two measures of sample entropy, *Statistics & Probability Letters*, 20, 1994, 225–234.
- [5] Correa, J. C., A new estimator of entropy, *Communications in Statistics – Theory and Methods*, 24, 1995, 2439–2449.