

Efficient estimation of Sobol' indices of any order from a single input/output sample.

October 31, 2025

PRIEUR, CLÉMENTINE

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The objective of the present work is to estimate Sobol' indices at any order in a given-data context, where a unique input/output sample is available. In that view, our approach consists of three main ingredients: one-step inference and nonpositive kernel estimation following [1] together with mirror-type transformations as introduced in [2,3]. We introduce two different estimators that are proved to be asymptotically normal and efficient. In addition, their numerical properties are illustrated on standard examples.

References:

- [1] K. Doksum and A. Samarov. Nonparametric estimation of global functionals and a measure of the explanatory power of covariates in regression. *The Annals of Statistics*, 1443–1473, 1995.
- [2] K. Bertin, N. Klutchnikoff, J. R. Léon, and C. Prieur. Adaptive density estimation on bounded domains under mixing conditions. *Electronic Journal of Statistics*, **14**(1):2198–2237, 2020.
- [3] L. Pujol. Nonparametric estimation of a multivariate density under kullback-leibler loss with ISDE. *arXiv preprint arXiv:2205.03199*, 2022.

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