

Multiplicative deconvolution under unknown error distribution

Thursday, 4 August 2022 16:00 (20 minutes)

In this talk, we construct a nonparametric estimator of the density $f : \mathbb{R}_+ \rightarrow \mathbb{R}_+$ of a positive random variable X based on an i.i.d. sample (Y_1, \dots, Y_n) of

$$Y = X \cdot U,$$

where U is a second positive random variable independent of X . More precisely, we consider the case where the distribution of U is unknown but an i.i.d. sample $(\tilde{U}_1, \dots, \tilde{U}_m)$ of the error random variable U is given.

Based on the estimation of the Mellin transforms of Y and U , and a spectral cut-off regularisation of the inverse Mellin transform, we propose a fully data-driven density estimator where the choice of the spectral cut-off parameter is dealt by a model selection approach. We demonstrate the reasonable performance of our estimator using a Monte-Carlo simulation.

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