

# 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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