

# The limit distribution of the $L_\infty$ -error of Grenander type estimators

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Let  $f$  be a non-increasing function defined on  $[0, 1]$ . Under standard regularity conditions, we derive the asymptotic distribution of the supremum distance between  $f$  and its isotonic estimator on any interval  $(\alpha_n, 1 - \alpha_n] \subset [0, 1]$ , where  $\alpha_n$  tends to zero at a suitable rate. The rate of convergence of the supremum distance is found to be of order  $(\log n/n)^{1/3}$  and the limiting distribution turns out to be Gumbel with a parameter depending on a functional of  $f$  and  $f'$ . The results are obtained in a general framework, which includes the Grenander estimator of a decreasing density, the least squares estimator of a monotone regression curve or an isotonic estimator of a decreasing hazard of right-censored observations.

This is joint work with Cécile Durot (Orsay), Vladimir Kulikov (ASR), and Fadoua Balabdaoui (Paris).