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Nonparametric Estimation of a Bathtub-Shaped Hazard

In the analysis of lifetime data, a key object of interest is the hazard function, or instantaneous failure rate. One natural assumption is that the hazard is bathtub, or U-shaped (i.e., first decreasing, then increasing). In particular, this is often the case in reliability engineering or human mortality.

In this talk I will discuss the nonparametric MLE and LSE of the hazard function under the additional assumption that it is also convex. These estimators are consistent and converge locally at a rate of $n^{2/5}$. Both iid sampling and iid sampling under right censoring will be considered.

This is joint work with Jon Wellner.