

The Efron-Petrosian estimator

The seminal paper by Bradley Efron and Vahe Petrosian on nonparametric methods for doubly truncated data, published by the Journal of the American Statistical Association in September 1999, will have its 25th birthday by next year. Many contributions on the topic have appeared along all this time, being relevant to Astronomy, Epidemiology, Engineering or Economics, among other fields. In this talk I will revisit some features of the Efron-Petrosian estimator, including: maximum-likelihood and self-consistency properties; inverse-probability weighting representation; numerical algorithms for practical computation; large-sample behaviour; and applications to smooth curve estimation, two-sample problems, regression analysis, goodness-of-fit tests and multi-state models. Some open questions will be presented too. I will defend the need to include methods for doubly truncated data in textbooks on Survival Analysis due to the impact they have in estimation. I will also discuss the importance of performing specification tests for the sampling bias in the doubly truncated setting. Real data examples will be used for illustration purposes. The existing R packages to deal with doubly truncated data will be reviewed.