Bayesian R-Estimates

Tom Hettmansperger[1], and Xiaojiang Zhan[2]

[1] Department of Statistics, The Pennsylvania State University, State College, PA, USA
[2] Merck & Co.

Abstract

When prior information exists, it may be desirable to incorporate it in a data analysis, even when we are using robust rank-based methods. In this talk we discuss the implementation of nonparametric rank-based procedures in a Bayesian context. We summarize the information in a sample of data via the (possibly asymptotic) distribution of some rank-based quantity, and use that distribution as a pseudo-likelihood. Meanwhile, we suppose a prior distribution for the parameter(s) of interest in the model. By Bayes' theorem, we can obtain the complete posterior distribution (or the posterior distribution up to a normalizing constant) of the parameter(s) given the rank-based quantity. Statistical inference then proceeds based on this posterior distribution. The one-sample location model is considered using several rank-based quantities from common scores statistics such as the sign statistic, the Wilcoxon signed rank statistic and the normal scores statistic.