Statistics Seminar
Department of Mathematics and Statistics

DATE:	Thursday, November 7, 2024
TIME:	1:15pm – 2:15pm
LOCATION:	WH 100E
SPEAKER:	Zifan Huang, Binghamton University
TITLE:	The Buckley–James Estimator and Induced Smoothing

Abstract

The Buckley–James (BJ) estimator is known to be consistent and efficient for a linear regression model with censored data. However, its application in practice is handicapped by the lack of a reliable numerical algorithm for finding the solution. For a given data set, the iterative approach may yield multiple solutions, or no solution at all. To alleviate this problem, the authors modify the induced smoothing approach originally proposed in 2005 by Brown & Wang. The resulting estimating functions become smooth, thus eliminating the tendency of the iterative procedure to oscillate between different parameter values. In addition to facilitating point estimation the smoothing approach enables easy evaluation of the projection matrix, thus providing a means of calculating standard errors. Extensive simulation studies were carried out to evaluate the performance of different estimators. In general, smoothing greatly alleviates numerical issues that arise in the estimation process. In particular, the one-step smoothing estimator eliminates non-convergence problems and performs similarly to full iteration until convergence. The proposed estimation procedure is illustrated using a dataset from a multiple myeloma study.

References:

Brown, B.M. & Wang, Y-G. (2005). Standard errors and covariance matrices for smoothed rank estimators. Biometrika 92, 149–158.

Wang, You-Gan ; Zhao, Yudong ; Fu, Liya (2016). The Buckley–James Estimator and Induced Smoothing Aust. N. Z. J. Stat. 58(2), 2016, 211–225