COLLOQUIUM

Department of Statistics and Probability
Michigan State University

Marc Hallin
Université libre de Bruxelles

Multivariate Quantiles and Multiple-Output Regression Quantiles: From L_1 Optimization to Halfspace Depth

Thursday, March 18, 2010
A405 Wells Hall
10:20 a.m. - 11:10 a.m.
Refreshments: 10:00 a.m.

Abstract

A new multivariate concept of quantile, based on a directional version of Koenker and Bassett's traditional regression quantiles, is introduced for multivariate location and multiple-output regression problems. In their empirical version, those quantiles can be computed efficiently via linear programming techniques. Consistency, Bahadur representation and asymptotic normality results are established. Most importantly, the contours generated by those quantiles are shown to coincide with the classical halfspace depth contours associated with the name of Tukey. This relation does not only allow for efficient depth contour computations by means of parametric linear programming, but also for transferring from the quantile to the depth universe such asymptotic results as Bahadur representations. Finally, linear programming duality opens the way to promising developments in depth-related multivariate rank-based inference. (This talk is based on a joint work with Daby Paindaveine and Miroslav Siman.)

To request an interpretor or other accompdations for people with disabilities, please call the Department of Statistics and Probability at 517-355-9589.