RUTGERS UNIVERSITY
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Seminar

Speaker: Marc Hallin, European Centre for Advanced Research in Economics and Statistics Université libre de Bruxelles

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

Date: Wednesday, April 28, 2010

Time: 3:20 p.m.

Place: 552 Hill center

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.