

Gastvortrag

Donnerstag, 21. Mai 2015
15.00 Uhr
Seminarraum II

Prof. Dr. Stephen L. Portnoy
University of Illinois, USA

Maximal Probability Discrepancies under Moment-matching Restrictions

Prof. Portnoy hat am Massachusetts Institute of Technology und Stanford University studiert. Er ist seit seinem Doktorat an Harvard University und der University of Illinois tätig gewesen, war einige Jahre lang ein Editor des Journal of the American Statistical Association, sowie Associate Editor der Annals of Statistics. Als eminenter Vertreter der mathematischen Statistik ist Portnoy Fellow der American Statistical Association und des Institute of Mathematical Statistics. Hauptrichtungen seiner Forschungsarbeit sind asymptotische Theorie, Quantilprozesse und Quantil-Regression, sowie robuste statistische Methoden.

Abstract:

The problem of characterizing a distribution by its moments dates to work by Chebyshev in the mid-nineteenth century. There are clear (and close) connections with characteristic functions, moment spaces, quadrature, orthogonal polynomials, approximation theory, and other very classical mathematical pursuits. In a paper in The American Statistician (2000), Lindsay and Basak posed the specific question of how far from normality could a distribution be if it matches k normal moments. They provided a bound on the maximal difference in the c.d.f. (the Kolmogorov norm), and implied that these bounds were attained.

In fact, the bound is not attained if the number of even moments matched is odd. An explicit solution is developed as a symmetric distribution with a finite number of mass points when the number of even moments matched is even, and this bound for the even case is shown to hold as an explicit limit for the subsequent odd case. As Lindsay noted, the discrepancies can be sizable even for a moderate number of matched moments. Some comments on implications are proffered.