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DEPARTMENT OF STATISTICS AND BIostatISTICS
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Seminar

Speaker: **Professor Daniel Vogel**
Institute for Complex Systems and Mathematical Biology
University of Aberdeen, UK

Title: **Spatial sign correlation**

Time: **3:20 – 4:20pm, Wednesday, September 9, 2015**

Place: **552 Hill Center**

Abstract

A robust correlation estimator based on the spatial sign covariance matrix (SSCM) is proposed. We derive its asymptotic distribution and influence function at elliptical distributions. Finite sample and robustness properties are studied and compared to other robust correlation estimators by means of numerical simulations. The proposed correlation estimator has a variety of nice properties. It is fast to compute, distribution-free within the elliptical model, as efficient as similarly robust estimators, and its asymptotic variance admits an explicit form, which facilitates inferential procedures.

Its main drawback is the inefficiency under strongly shaped models, i.e., where the eigenvalues of the shape matrix strongly differ. The efficiency may be largely improved by a prior componentwise standardization. We also establish the asymptotic normality of the thus obtained two-step estimator, and show in particular that the loss due to having to estimate the marginal scales - as compared known scale - is nil asymptotically. An important consequence is that the asymptotic variance of the two-step estimator only depends on the correlation coefficient itself. This allows to devise a variance-stabilizing transformation in the same vein as Fishers z-transformation, but which is valid for all elliptical distributions.

The talk is based on joint work with Alexander Durre, Roland Fried and David Tyler

**** Refreshments will be served @2:50pm in Room 502 Hill Center ***