Kolloquium „Statistische Methoden in der empirischen Forschung“

Wann: 04. Dezember 2012, 17:00 – 18:30 Uhr

Wo: Landwirtschaftlich-Gärtnerische Fakultät der HU, Hörsaal 2, 2. Etage, Invalidenstr. 42, 10115 Berlin

David Ellenberger & Marius Placzek (Georg-August-Universität Göttingen)

Potential pitfalls and points to consider when analysing high-dimensional repeated measurements

The analysis of high-dimensional data has become an important topic in medical and biological research. Applying linear models theory to high dimensional data sets can lead to substantial errors. Different situations of possible type-one error inflation will be presented.

Marius Placzek will show how crucial the assumption of equal covariance matrices is in practice, and that it is much more than a purely technical condition one can safely assume is met. For the two-sample case under normality he will present simulation results showing how the standard method (Huynh-Feldt) is likely to dramatically fail when this assumption is violated. As a remedy, he will be presenting a new test statistic based on a modified Huynh-Feldt correction without restrictions to the structure or the equality of the covariance matrices.

Another active research area is the evaluation of high-dimensional non-normal data. A general solution seems impossible because the multivariate central limit theorem does not hold for increasing dimensions unless the sample size is increasing in n squared - a condition which can hardly be met in practice.

However, with the so-called Bai-Saranadasa model it is still possible to fit a huge class of non-normal data for practical purposes. Important restrictions to the covariance matrix, however, remain and will be discussed. A new test statistic based on very accurate fitting moment approximations for the one sample case will be presented by David Ellenberger.