Wiener Biometrische Sektion
der Internationalen Biometrischen Gesellschaft
Region Österreich – Schweiz
http://www.meduniwien.ac.at/wbs/

Einladung zum

Biometrischen Kolloquium

am **Montag, 21. Jänner 2013** um **11:00 Uhr** (s.t.)

in der Informatik-Bibliothek (Ebene 3, Raum 88.03.806) des
Zentrums für Medizinische Statistik, Informatik und Intelligente
Systeme (CeMSIIS) der Medizinischen Universität Wien
Spitalgasse 23, 1090 Wien
(Plan siehe http://www.muw.ac.at/cemsiis/allgemeines/anschrift/)

Vortragende:

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Joint modelling of multivariate longitudinal mixed outcomes and a time-to-event: a latent variable approach

Wir freuen uns auf zahlreichen Besuch.

Gerhard Svolba
Präsident

Franz König
Sekretär

Joint modelling of multivariate longitudinal mixed outcomes and a time-to-event: a latent variable approach

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The joint modelling of a longitudinal marker and the time to an event has become increasingly popular in medical research. To date, most statistical developments focused on a single and quantitative longitudinal outcome. Yet, other types of longitudinal outcomes have come out in medical studies: sets of bounded quantitative or ordinal scales that are collected simultaneously with a specific interest in the underlying process that generated them. Examples include quality of life scales that are collected along with primary efficacy outcomes in cancer research, or psychometric tests that evaluate cognitive functioning in cognitive ageing studies. In addition to the multivariate setting, these bounded quantitative or ordinal outcomes usually share the particularity of having ceiling/floor effects, and a varying sensitivity to change referred to as curvilinearity which may induce biases in the analyses when not taken into account.

We first introduce a latent process model to describe jointly multivariate longitudinal scales measuring the same underlying latent process. The main asset of this model is that it handles multiple types of longitudinal outcomes (standard quantitative, ordinal and bounded quantitative curvilinear outcomes). Specifically the latent process trajectory is described by a linear mixed model while equations of observation combine outcome-specific threshold models for ordinal outcomes and models based on a series of flexible parameterised nonlinear families of transformations for quantitative (bounded) outcomes.

We then extend this approach to jointly model correlated longitudinal scales and a time-to-event using a latent class approach. It consists in assuming that the association between the longitudinal outcomes (through their common latent process) and the censored time-to-event is explained by a latent discrete structure of the population.
These models are illustrated through several applications from a large population-based cognitive ageing study.