Analysis of Nonlinear Longitudinal Data: Statistical Modelling and Experimental Design

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Longitudinal data are ubiquitous in biomedical research, economics, environmental research, psychometrics as well as many other domains, and analysis of these data present unique and far-reaching challenges in applied statistical research. These data often also contain latent (hidden) cohorts/groups, which – with the aid of the EM algorithm and associated methods – can be discerned in order to help researchers in better understanding their data and underlying phenomena. Although the fields of Finite Mixture Models and Trajectory Analysis in the context of longitudinal data analysis is relatively new, controversy exists as to how best to discern these patterns and data.

This talk focuses on the larger field of estimation and design of longitudinal data, with an eye to trajectory analysis and finite mixture models in modelling nonlinear phenomena. We make connections to the linear and generalized linear cases - as well as highlighting important differences and relevant software packages.