



Joint Modelling of Longitudinal and Time-to-Event Data - From classical approaches to machine learning

Elisabeth Waldmann
(Friedrich-Alexander-Universität, Erlangen-Nürnberg)

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Joint Models for longitudinal and time-to-event data have gained a lot of attention in the last few years as they are a helpful technique to approach a common data structure in longitudinal studies where continuous outcomes are recorded alongside event times. Those two processes are often linked and the two outcomes should thus be modeled jointly in order to prevent the potential bias introduced by independent modelling. Most of these joint models combine standard mean regression approaches with time to event models, ignoring the fact that the underlying conditions are not necessarily fulfilled. In the first part of the talk, beyond the mean modelling approaches within the joint modelling setup will be explained and illustrated. Commonly, joint models are estimated in likelihood based expectation maximization or Bayesian approaches using classical frameworks where variable selection is problematic and which do not immediately work for high-dimensional data. The second part of the talk shows the implementation of a state-of-the-art machine learning approach that tackles the questions of variable selection and high dimensional data.