



## **SEMINAR**

# ***Automated effects selection via regularization in Cox frailty models***

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In all sorts of regression problems it has become more and more important to deal with high dimensional data with lots of potentially influential covariates. A possible solution is to apply estimation methods that aim at the detection of the relevant effect structure by using regularization methods. In this talk, the effect structure in the Cox frailty model, which is the most widely used model that accounts for heterogeneity in time-to-event data, is investigated. Since in time-to-event modeling one has to account for possible variation of the effect strength over time, the selection of the relevant features has to distinguish between several cases: covariates can have time-varying effects, can have time-constant effects or be irrelevant. Two different regularization approaches are discussed that are able to automatically distinguish between these types of effects to obtain a sparse representation that includes the relevant effects in a proper form, namely penalization and boosting. This idea is applied to a real world data set, illustrating that the complexity of the influence structure can be strongly reduced by using such a regularization approach.