

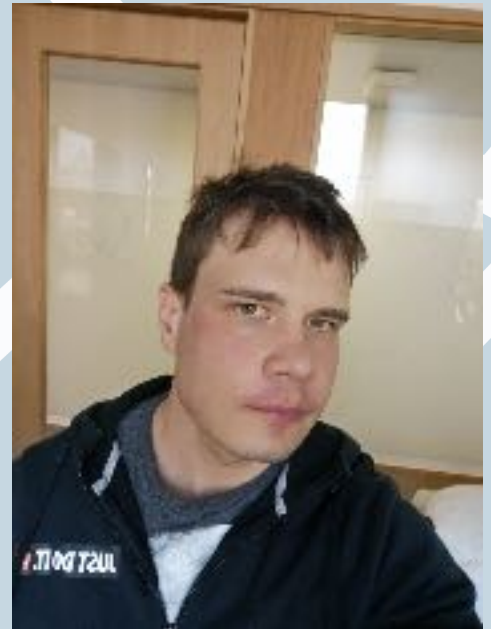
High Dimensional Nonstationary Time Series

# IRTG 1792 Short Course

**Pekka Malo**

## Structural Change Detection in Multivariate Systems: An Application to Financial News Analytics

Structural change detection problems are often encountered in analytics and econometrics, where the performance of a model can be significantly affected by unforeseen changes in the underlying relationships. Although these problems have a comparatively long history in statistics, the number of studies done in the context of multivariate data under nonparametric settings is still small. In this paper, we propose a consistent method for detecting multiple structural changes in a system of related regressions over a large dimensional variable space. In most applications, practitioners also do not have a priori information on the relevance of different variables, and therefore, both locations of structural changes as well as the corresponding sparse regression coefficients need to be estimated simultaneously. The method combines nonparametric energy distance minimization principle with penalized regression techniques. After showing asymptotic consistency of the model, we compare the proposed approach with competing methods in a simulation study. As an example of a large scale application, we consider structural change point detection in the context of news analytics during the recent financial crisis period. We will also discuss recent developments in financial sentiment analysis.



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