

On Changepoint Detection in a Series of Stimulus-Response Data

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Functional data analysis is a branch of statistics that deals with observations X_1, X_2, \dots, X_n which are curves. We demonstrate the power of functional data models for a statistical analysis of stimulus-response experiments, which is quite a natural way of looking at this kind of data and which makes full use of the information available. In particular, we focus on the detection of a change in the mean of the response in a series of stimulus-response curves. We first consider the case where the data are i.i.d after which we take into account dependence in time. Additionally, we also consider other kinds of changes over time in the data generating mechanism beyond changes in the mean.

Keywords: Functional data, functional data models, stimulus-response data, changepoint test, functional time series, functional autoregression