

High-dimensional time series segmentation under parametric models

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Abstract:

In the first part of this talk, I will talk about statistically and computationally efficient detection of multiple change points in regression settings permitting serial dependence and heavy-tailedness. The proposed methodology combines moving window-based search on a coarse grid and a simple localisation refinement step. It is shown to achieve (near-)minimax optimal separation and localisation rates under Gaussianity. As a by-product, we show the consistency of the Lasso estimator in the presence of serial dependence, heavy tails and change points. In the second part of the talk, I will move to a situation where the commonly made assumption in the sparse regression literature is violated in the presence of strong cross-sectional correlations. A two-stage methodology is developed under a piecewise stationary factor-adjusted vector autoregressive model, and its consistency is established under general assumptions allowing for the presence of strong temporal and spatial dependence and heavy-tails.