

High-Dimensional
Non-Stationary Time Series Analysis



IRTG 1792 Short Course

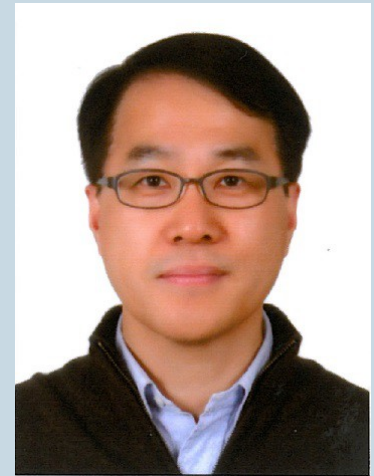
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Data-adaptive PCA and related topics

The ordinary PCA is useful for dimension reduction and for identifying important features of data that consist of a large number of interrelated variables. However, it is stringent to the Gaussian assumption of the data, and therefore may not be efficient for analyzing real observations that may be non-Gaussian distributed, such as skewed or heavy-tailed data. To extend the scope of PCA to non-Gaussian distributed data, a new approach for PCA is proposed. The core of the methodology is the use of a composite quantile, which is a weighted linear combination of convex loss functions instead of the square loss function, and the weights are determined data-adaptively. In addition, a practical algorithm to implement the data-adaptive PCA is derived. Moreover, a penalized version of the proposed composite quantile PCA with a penalty is considered.

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LvB library, SPA 1



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