

Estimation methods of Matrix-valued Autoregressive model

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Abstract

In modern time series analysis, increasingly complex and high-dimensional data sets are often considered. To address the problem of modeling multivariate time series, the matrix-valued autoregressive (MAR) model was introduced in [1]. Estimation methods based on projection onto the space of Kronecker products, least squares (LSE), and maximum likelihood estimation (MLE) have already been developed. However, moment-based estimation methods have not yet been investigated.

In this talk, I introduce new estimation methods for the Matrix Autoregressive (MAR) model by extending the classical Yule-Walker equations to the matrix setting. I discuss the advantages of matrix-based formulations compared to vector autoregressive (VAR) models and outline the main similarities and differences between these approaches. MAR models preserve the inherent matrix structure of the data and require substantially fewer parameters than VAR models, making them efficient and interpretable tools for high-dimensional time series analysis.

Keywords

Matrix-valued time series, Multivariate time series, Estimation, Autoregressive.

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References

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