

Spectral Subsampling MCMC for Stationary Multivariate Time Series

Matias Quiroz

University of Technology Sydney.

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Abstract

We propose a subsampling Markov chain Monte Carlo approach to stationary multivariate time series by subsampling periodogram matrix observations in the frequency domain. We demonstrate the methodology on a novel multivariate generalisation of the autoregressive tempered fractionally differentiated moving average model (ARTFIMA). The new model is shown to provide a better fit compared to multivariate autoregressive moving average models for three real world examples. We demonstrate that spectral subsampling may provide up to two orders of magnitude faster estimation, while retaining MCMC sampling efficiency and accuracy, compared to spectral methods using the full dataset. This is joint work with Mattias Villani, Robert Kohn and Robert Salomone.

References

- [1] M. Villani, M. Quiroz, R. Kohn, R. Salomone. *Spectral Subsampling MCMC for Stationary Multivariate Time Series*, [arXiv 2104.02134](https://arxiv.org/abs/2104.02134), 2021.