



THE UNIVERSITY OF
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Department of Statistics

MASTER'S THESIS PRESENTATION

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Estimation of Latent Factors for High-Dimensional Time Series

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ABSTRACT

This paper deals with the dimension reduction of high-dimensional time series based on the information from the auto-covariance matrix. In particular, we allow the dimension of time series to be as large as, or even larger than, the length of observed time series. We decompose the N -dimensional time series into two parts: a dynamic part driven by lower dimensional factors, and a white noise static part. The estimation of the factor loading matrix and the factor process itself is conducted by a eigen-analysis on a matrix function of several auto-covariance. We show that when all the factors are strong, the curse of dimensionality is cancelled out by the blessing of dimensionality. The proposed method is illustrated in several simulation studies. An application is also performed to an real implied volatility data set.

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