High-dimensional latent Gaussian count time series

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ABSTRACT

The focus of this talk is stationary vector count time series models defined via deterministic functions of a latent stationary vector Gaussian series. The construction is very general and ensures a pre-specified marginal distribution for the counts in each dimension, depending on unknown parameters that can be marginally estimated. The vector Gaussian series injects flexibility in the model's temporal and cross-sectional dependencies, perhaps through a parametric model akin to a vector autoregression. This talk discusses how the latent Gaussian model can be estimated by relating the covariances of the observed counts and the latent Gaussian series. In a possibly high-dimensional setting, concentration bounds are established for the differences between the estimated and true latent Gaussian autocovariances, in terms of those for the observed count series and the estimated marginal parameters. An application of the result is given to the case when the latent Gaussian series follows a VAR model, and its parameters are estimated sparsely through a LASSO-type procedure.

The talk is based on joint work with Robert Lund (University of California - Santa Cruz) and Vladas Pipiras (University of North Carolina - Chapel Hill)