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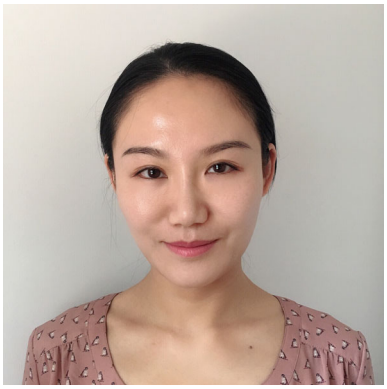

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Technology, Operations and Statistics
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Community Network Auto-Regression for High-Dimensional Time Series

Wednesday, October 6, 2021
11:45 AM EST

Zoom Meeting: Meeting ID: 924 8283 7055
Password: 378160

https://rutgers.zoom.us/j/92482837055?pwd=TktKVVU2Z1JzZnZQbm1TNUs3K0pmZz09

Virtual Coffee session before the seminar at 11:30 AM EST

Abstract:
Modeling responses on the nodes of a large-scale network is an important task that arises commonly in practice. This paper proposes a community network vector autoregressive (CNAR) model, which utilizes the network structure to characterize the dependence and intra-community homogeneity of the high dimensional time series. The CNAR model greatly increases the flexibility and generality of the network vector autoregressive (Zhu et al, 2017, NAR) model by allowing heterogeneous network effects across different network communities. In addition, the non-community-related latent factors are included to account for unknown cross-sectional dependence. The number of network communities can diverge as the network expands, which leads to estimating a diverging number of model parameters. We obtain a set of stationary conditions and develop an efficient two-step weighted least-squares estimator. The consistency and asymptotic normality properties of the estimators are established. The theoretical results show that the two-step estimator improves the one-step estimator by an order of magnitude when the error admits a factor structure. The advantages of the CNAR model are further illustrated on a variety of synthetic and real datasets.

This is a joint work with Jianqing Fan and Xuening Zhu.

Bio: Elynn Chen is an Assistant Professor of Statistics at NYU Stern School of Business. She is generally interested in developing novel methods for complex time series analysis and data-driven decision-making, with applications in business, economics, and health care. Her work has been applied to international trade, corporate finance, clinical dynamic treatments and has been recognized by NSF Postdoc Award DMS-1803241.

Before joining NYU Stern, she worked as a postdoctoral researcher at the Department of Electrical Engineering and Computer Sciences at the University of California, Berkeley, and ORFE at Princeton University. She received her Ph.D. in Statistics from Rutgers University, advised by Prof. Rong Chen.