Joint Seminar

The Hong Kong University of Science and Technology

Joint Statistics Seminar

Department of ISOM & Department of MATH

High Dimensional Forecast Combinations Under Latent Structures

by

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Time: 9:00 – 10:00 am
Venue: Zoom ID 922 7350 7265

Abstract This paper presents a novel high-dimensional forecast combination estimator in the presence of many forecasts and potential latent group structures. The new algorithm, which we call ℓ2-relaxation, minimizes the squared ℓ2-norm of the weight vector subject to a relaxed version of the first-order conditions, instead of minimizing the mean squared forecast error as those standard optimal forecast combination procedures. A proper choice of the tuning parameter achieves bias and variance trade-off, and incorporates as special cases the simple average (equal-weight) strategy and the conventional optimal weighting scheme. When the variance-covariance (VC) matrix of the individual forecast errors exhibits latent group structures -- a block equicorrelation matrix plus a VC for idiosyncratic noises, ℓ2-relaxation delivers combined forecasts with roughly equal within-group weights. Asymptotic optimality of the new method is established by exploiting the duality between the sup-norm restriction and the high-dimensional sparse ℓ1-norm penalization. Excellent finite sample performance of our method is demonstrated in Monte Carlo simulations. Its wide applicability is highlighted in three real data examples concerning empirical applications of microeconomics, macroeconomics, and finance.

Based on joint work with Liangjun Su, Tian Xie.

All interested are welcome!

For details, please contact ISOM Department.