

ACMS Statistics Seminar

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154 Hurley Hall
3:30– 4:30 PM



Minimax Posterior Convergence Rates and Model Selection Consistency in High-dimensional DAG Models based on Sparse Cholesky factors

In this talk, we will discuss the high-dimensional sparse directed acyclic graph (DAG) models under the sparse Cholesky prior. Among our results, strong model selection consistency or graph selection consistency is obtained under more general conditions than those in the existing literature. Compared to existing literature, the required conditions are weakened in terms of the dimensionality, sparsity and lower bound of the nonzero elements in the Cholesky factor. Furthermore, our result does not require the irrepresentable condition, which is necessary for Lasso type methods. We also derive the posterior convergence rates for precision matrices and Cholesky factors with respect to various matrix norms. The obtained posterior convergence rates are the fastest among those of the existing Bayesian approaches. In particular, we prove that our posterior convergence rates of Cholesky factors are the minimax or at least nearly minimax depending on the relative size of true sparseness for the entire dimension. The simulation study confirms that the proposed method outperforms the competing methods.

The Department of Applied and Computational
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