

Colloquium

UNIVERSITY OF GEORGIA
DEPARTMENT OF STATISTICS

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“Non-concave Penalized Composite Likelihood Estimation of Sparse Ising Models”

The Ising model is a useful tool for studying complex interactions within a system. The estimation of such a model, however, is rather challenging especially in the presence of high dimensional parameters. In this work, we propose efficient procedures for learning a sparse Ising model based on a penalized composite likelihood with non-concave penalties.

Non-concave penalized likelihood estimation has received a lot of attention in recent years. However, such an approach is computationally prohibitive under high dimensional Ising models. To overcome such difficulties, we extend the methodology and theory of non-concave penalized likelihood to penalized composite likelihood estimation. An efficient solution path algorithm is devised by using a new coordinate-minorization-ascent algorithm. Asymptotic oracle properties of the proposed estimator are established with NP-dimensionality. We demonstrate its finite sample performance via simulation studies and further illustrate our proposal by studying the Human Immunodeficiency Virus type 1 (HIV-1) protease structure based on data from the Stanford HIV Drug Resistance Database.

This talk is based on a joint paper with Lingzhou Xue and Tianxi Cai.

Thursday September 2, 2010

ROOM 306

Statistics Building

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Athens, GA 30602

3:30 P.M. – Room 306, Statistics Building

Refreshments following talk at 4:30 P.M. in room 230 (The Cohen Room)