



THE UNIVERSITY OF  
CHICAGO

Department of Statistics  
STATISTICS COLLOQUIUM

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Inference and Optimalities in Estimation of Gaussian  
Graphical Model

MONDAY, March 11, 2013, at 4:00 PM

133 Eckhart Hall, 5734 S. University Avenue

*Refreshments following the seminar in Eckhart 110*

ABSTRACT

Gaussian graphical model has a wide range of applications. The study of Gaussian graphical model had attracted a lot of attention recently. In this talk we consider a basic question: when is it possible to obtain statistical inference for estimation of Gaussian Graphical Model? A regression approach will be proposed to obtain asymptotically efficient estimation of each entry when the precision matrix is sufficient sparse. If the precision matrix is not sufficient sparse, i.e., the sparseness condition fails, a lower bound is established to show that it is no longer possible to achieve a parametric rate estimation of each entry by a construction of a subset of sparse precision matrices and Le Cam's Lemma.

If time permits, we apply the asymptotic normality result to do adaptive support recovery, to obtain adaptive rate-optimal estimation of the precision matrix under various matrix  $l_q$  norms, and to do inference and estimation for a class of latent variable graphical models, without the need of the irrepresentable condition and the  $l_1$  constraint of the precision matrix, which are commonly required in literature.

This is a joint work with Zhao Ren, Tingni Sun and Cun-Hui Zhang.