THE UNIVERSITY OF CHICAGO | DEPARTMENT OF STATISTICS

# Statistics Colloquium

CHAO GAO
Department of Statistics
University of Chicago

"Detection and Recovery of Sparse Signal Under Correlation"

MONDAY, OCTOBER 3rd, 2022, at 4:30 PM
Jones 303, 5747 S. Ellis Avenue
*Refreshments before the seminar at 4:00 PM in Jones 304.*

## ABSTRACT

We study a p dimensional Gaussian sequence model with equicorrelated noise. In the first part of the talk, we consider detection of a signal that has at most s nonzero coordinates. Our result fully characterizes the nonasymptotic minimax separation rate as a function of the dimension p, the sparsity s and the correlation level. Surprisingly, not only does the order of the minimax separation rate depend on s, it also varies with p-s. This new phenomenon only occurs when correlation is present. In the second part of the talk, we consider the problem of signal recovery. Unlike the detection rate, the order of the minimax estimation rate has a dependence on p-2s, which is also a new phenomenon that only occurs with correlation. We also consider detection and recovery procedures that are adaptive to the sparsity level. While the optimal detection rate can be achieved adaptively without any cost, the optimal recovery rate can only be achieved in expectation with some additional cost.

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