

NYU Stern School of Business
Department of Information, Operations & Management Sciences
STATISTICS RESEARCH SEMINAR

TOPIC: Achieving Optimal Misclassification Proportion in Stochastic Block Model

SPEAKER: Zongming Ma (Wharton)

DATE: Friday, September 11, 2015

TIME: 11:30 AM - 12:30 PM

PLACE: KMC 4-80

Abstract

Community detection is a fundamental statistical problem in network data analysis. Many algorithms have been proposed to tackle this problem. Most of these algorithms are not guaranteed to achieve the statistical optimality of the problem, while procedures that achieve information theoretic limits for general parameter spaces are not computationally tractable. In this paper, we present a computationally feasible two-stage method that achieves optimal statistical performance in misclassification proportion for stochastic block model under weak regularity conditions. Our two-stage procedure consists of a refinement stage motivated by penalized local maximum likelihood estimation. This stage can take a wide range of weakly consistent community detection procedures as initializer, to which it applies and outputs a community assignment that achieves optimal misclassification proportion with high probability. The practical effectiveness of the new algorithm is demonstrated by competitive numerical results. This is a joint work with Chao Gao, Anderson Zhang and Harrison Zhou at Yale University.

Bio

Zongming Ma received the B.S. degree in Mathematics from Peking University, Beijing, China, in 2005 and the Ph.D. degree in Statistics from Stanford University, Stanford, CA, in 2010. He has been an assistant professor in the Department of Statistics, The Wharton School, University of Pennsylvania, Philadelphia, PA, since 2010. His research interest is in high-dimensional statistics. Dr. Ma was a recipient of the NSF CAREER Award in 2014.