



Cornell CIS
Statistical Science

STATISTICS SEMINAR

Wednesday, March 22, 2017

4:15 pm

G01 Biotechnology

YIYUAN SHE

Department of Statistics,
Florida State University

On the analysis of Bregman-surrogate algorithms for nonconvex optimization

Modern statistical problems often involve minimizing objective functions that are not necessarily convex or smooth. This paper proposes and investigates a broad surrogate framework, defined by generalized Bregman divergence functions, for developing scalable algorithms. Local linear approximation, mirror descent, iterative thresholding, and DC programming can all be viewed as particular instances. The Bregman re-characterization enables us to choose suitable measures of computational error to establish global convergence rate results even for nonconvex problems in high-dimensional settings. Moreover, under some regularity conditions, the sequence of iterates in the general Bregman surrogate optimization can be shown to approach the statistical truth within the desired accuracy geometrically fast. The paper also reveals that these algorithms can be accelerated with a careful control of relaxation and stepsize parameters. Simulation studies are performed to support the theoretical results.

Yiyuan She received the B.S. degree in mathematics and the M.S. degree in computer science from Peking University, in 2000 and 2003, respectively, and the Ph.D. degree in statistics from Stanford University in 2008. He is currently an Associate Professor with the Department of Statistics, Florida State University. He received the Developing Scholar Award from Florida State University and the CAREER Award from NSF. His research interests include high-dimensional statistics, machine learning, optimization, robust statistics, statistics computing, and network science.

Refreshments will be served following the seminar in 1181 Comstock Hall.