MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

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High Dimensional Bridge Regression: A Unified View

Thursday, February 16, 2017
10:20 a.m. - 11:10 am
Refreshments 10:00 am
C405 Wells Hall

Abstract

In many application areas ranging from bioinformatics to imaging, we are faced with the problem of recovering a (approximately) sparse vector from its noisy linear observations. We consider the popular class of Lq regularized least squares (LQLS), a.k.a. bridge regression, under the high-dimensional asymptotic regime where the sample size is of the same order as the predictor dimension. By integrating large sample theory tools from statistical physics and compressed sensing, we establish sharp asymptotic characterizations and provide a unified view of bridge regression for all the values of q. In the first part of the talk, I will address the problem: which q performs best for estimating what sparse vector under what conditions? I will then move to propose a favorable way for doing variable selection via bridge regression, and demonstrate how the goal of variable selection is tightly aligned with parameter estimation. Along the talk, I will also briefly discuss approximate message passing algorithms which play a key role in both theoretical analysis and practical use.

To request an interpreter or other accommodations for people with disabilities, please call the Department of Statistics and Probability at 517-355-9589.