The Hong Kong Polytechnic University
Department of Applied Mathematics

Colloquium

Estimating subgroup-specific treatment effects via concave fusion

by

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Abstract

Understanding treatment heterogeneity is essential to the development of precision medicine, which seeks to tailor medical treatments to subgroups of patients with similar characteristics. One of the challenges to achieve this goal is that we usually do not have a priori knowledge of the grouping information of patients with respect to treatment. To address this problem, we consider a heterogeneous regression model by assuming that the coefficients for treatment variables are subject-dependent and belong to different subgroups with unknown grouping information. We develop a concave fusion penalized method for automatically estimating the grouping structure and the subgroup-specific treatment effects, and derive an alternating direction method of multipliers algorithm for its implementation. We also study the theoretical properties of the proposed method and show that under suitable conditions there exists a local minimizer that equals the oracle least squares estimator with a priori knowledge of the true grouping information with high probability. This provides theoretical support for making statistical inference about the subgroup-specific treatment effects based on the proposed method. We evaluate the performance of the proposed method by simulation studies and illustrate its application by analyzing the data from the AIDS Clinical Trials Group Study. This is joint work with Shujie Ma.

Date :   23 May, 2016 (Monday)
Time :   4:00p.m. – 5:00p.m.
Venue : TU801, The Hong Kong Polytechnic University

* * *   ALL ARE WELCOME   * * *