Optimal Two Stage Adaptive Enrichment Designs for Randomized Trials Using Sparse Linear Programming

Time:  3:00 – 4:00 PM  
Date:  Friday, October 7, 2016  
Place:  Alter Hall 745

Abstract

Adaptive enrichment designs involve preplanned rules for modifying enrollment criteria based on accruing data in a randomized trial. We focus on designs where the overall population is partitioned into two predefined subpopulations, e.g., based on a biomarker or risk score measured at baseline. The goal is to learn which populations benefit from an experimental treatment. Two critical components of adaptive enrichment designs are the decision rule for modifying enrollment, and the multiple testing procedure. We provide a general method for simultaneously optimizing both of these components for two stage, adaptive enrichment designs. We minimize the expected sample size under constraints on power and the familywise Type I error rate. It is computationally infeasible to directly solve this optimization problem due to its nonconvexity. The key to our approach is a novel discrete representation of this optimization problem as a sparse linear program. We apply advanced optimization methods to solve this problem to high accuracy, revealing new, approximately optimal designs. Joint work with Michael Rosenblum and Han Liu.

Guest Parking Available in the Liacouras Garage  
(Located on 15th Street between Montgomery and Cecil B. Moore Avenues)