



Estimating treatment effect heterogeneity in randomized program evaluation

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When evaluating the efficacy of social programs and medical treatments using randomized experiments, the estimated overall average causal effect alone is often of limited value and the researchers must investigate when the treatments do and do not work. Indeed, the estimation of treatment effect heterogeneity plays an essential role in (1) selecting the most effective treatment from a large number of available treatments, (2) ascertaining subpopulations for which a treatment is effective or harmful, (3) designing individualized optimal treatment regimes, (4) testing for the existence or lack of heterogeneous treatment effects, and (5) generalizing causal effect estimates obtained from an experimental sample to a target population. In this paper, we formulate the estimation of heterogeneous treatment effects as a variable selection problem. We propose a method that adapts the Support Vector Machine classifier by placing separate sparsity constraints over the pre-treatment parameters and causal heterogeneity parameters of interest. The proposed method is motivated by and applied to two well-known randomized evaluation studies in the social sciences. Our method selects the most effective voter mobilization strategies from a large number of alternative strategies, and it also identifies the characteristics of workers who greatly benefit from (or are negatively affected by) a job training program. In our simulation studies, we find that the proposed method often outperforms some commonly used alternatives.

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