Dynamic Adaptive Procedures for False Discovery Rate Estimation and Control

Multiple testing has generated a surging interest in recent years due to the wide availability of large and complex modern data sets. Much research focused on the false discovery rate (FDR) estimation and control, and adaptive procedures have particularly attracted growing attention. By incorporating good estimates of the proportion of true null hypotheses among all hypotheses, adaptive procedures have been shown to increase the power of detecting non-null hypotheses while maintaining the FDR. Most existing adaptive procedures rely on tuning parameters, which can be either assigned \textit{a priori} (fixed) or estimated from data (dynamically). In this talk, I will first present finite sample results of conservative FDR estimation, for fixed and dynamic adaptive procedures. Then I will derive asymptotic results on FDR estimation and control for a class of dynamic adaptive procedures under some weak dependence condition. Simulation results show that a novel dynamic adaptive procedure achieves more power through smaller estimation errors for null proportion under independence and mild dependence conditions.