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MASTER'S THESIS PRESENTATION

Reweighting the Knockoff Filter for Computational Efficiency

WHEN
May 4, 2022
1:00 PM

WHERE
Zoom Meeting
For ZOOM presentations, details will be provided in an email announcement for this seminar.

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We consider the variable selection problem, where we attempt to identify variables from $X_1, ..., X_p$ that are influential for the response variable Y. When the distribution of the covariates X are known exactly, the model-X knockoff provides a solution to such problem with guaranteed false discovery rate control. It constructs copies of the covariates with similar covariance structure that serves as controls for the number of false discoveries. When the distribution of X is complicated to evaluate or sample from but can be approximated relatively well by some simpler distribution, robust model-X knockoff framework can be applied to achieve false discovery rate up to a factor. In this paper, we consider the setting where the joint distribution of X is sufficiently complex so that sampling the knockoffs from the exact joint distribution is computationally prohibitive. Our proposed method samples from an approximate model and then corrects for the difference. This is related to the robust knockoffs framework that analyzes the setting where the model we sample from is an approximation because the true model is unknown. Our theoretical analysis suggests that the FDR control may be maintained using this method.

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