



THE UNIVERSITY OF
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Department of Statistics

MASTER'S THESIS PRESENTATION

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An Extension of Susie Model with Mixture-Gaussian Prior

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ABSTRACT

We extend the "Sum of Single Effects" (SuSiE) model - a Bayesian approach to variables selection in linear regression, to SuSiE-mixture model. SuSiE model assumes a slab-and-spike prior on the regression coefficients, and we generalize the prior to a mixture of two Gaussian distributions centered at 0. We also extend the corresponding fitting procedure - Iterative Bayesian Stepwise Selection (IBSS) - which is a Bayesian analogue of stepwise selection methods. Specifically we introduce an additional ridge regression step to IBSS, based on variational approximation to the posterior distribution under the SuSiE-mixture model. Our methods provide extra flexibility to SuSiE model, and reduce the false-positive significantly. We demonstrate through simulated experiments.