



THE UNIVERSITY OF
CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

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An Adaptive Shrinkage Approach to Assess Differential Gene
Expression

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ABSTRACT

One of the primary goals in genomic studies is to compare the expression level of genes under two conditions. Many methods have been proposed to evaluate differential gene expression by shrinking gene-specific variances towards a common value. However, these methods make the assumption that gene-specific means and variances are conditionally independent. Here we propose an adaptive hierarchical model to jointly model the gene-specific effect means and variances, and formulate a Bayesian approach to assess the significance of differential expression. We compare our approach to the widely used moderated t -statistic (Smyth, 2004) in various simulation studies, and apply our method to a widely studied breast cancer dataset.

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