



THE UNIVERSITY OF
CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

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An Extension of Equal Local Levels Method --- For Test Statistics
Other Than Z-scores

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ABSTRACT

Genome-wide association studies (GWAS) can provide insight into the genetic basis of complex traits. Due to the scarcity and weakness of true signals and the correlation between Single Nucleotide Polymorphisms (SNPs), its corresponding multiple testing problem is not easy to deal with. Traditional Equal Local Levels (ELL) method to test the association between traits and SNPs is based on Z-scores which limits the application to Z tests only. By deriving the relationship between correlations of bivariate folded and standard normal distributions, we expand the ability of ELL method to deal with more types of tests. The only difference in the calculation of ELL method and the extended one lies in the estimation of the absolute value of correlations which helps us compare and evaluate the performance through simulation studies. We also apply the extended ELL method of estimating correlations to the mouse advanced intercross line (AIL) dataset and discuss the cases when the method works well.