



The University of Chicago
Department of Statistics

SECOND YEAR PHD PRESENTATION

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**Quasi-likelihood Score Testing with Related
Individuals**

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ABSTRACT

In genetic study, the relatedness among individuals may be considerable. Neglecting such correlations among individuals can lead to seriously spurious conclusions. Typical examples includes goodness-of-fit test for Hardy-Weinberg Equilibrium (HWE), χ^2 test for genome-wide association study, etc. We propose a series of new tests (QL-HW test, QLS test, W_{QLS}) which models the correlation between alleles and/or individuals based on the quasi-likelihood framework. Compared with the classical approaches, the new test effectively controls the inflated type I error and gains additional power. Time allowed, we'll investigate some computational issues.

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