



THE UNIVERSITY OF
CHICAGO

Department of Statistics
DISSERTATION PROPOSAL

MIAOYAN WANG

Department of Statistics
The University of Chicago

**Mixed-Model and Quasi-Likelihood Approaches to
Genetic Association Mapping with Related Individuals**

WEDNESDAY, November 13, 2013, at 3:00 PM

117 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

In this proposal, we'll talk about two ongoing projects.

The first one focus on the optimal selection of individuals to genotype in association studies. We consider samples that include some dependent individuals, with the kinship matrix assumed known. The retrospective version of mixed linear model provides a natural way to incorporate partial information in the analysis. We propose G-STRATEGY, which uses simulated annealing to maximize noncentrality parameter based on quasi-score test of association in the retrospective model. G-STRATEGY has been shown not only the most asymptotically powerful for the assumed model, but also robust to more complex trait models. It's also computationally feasible to run on large data-set with arbitrarily related individuals such as IHA data.

The second project focus on joint mapping e.g. with both host and pathogens. We'll introduce the motivation and consider quasi-likelihood approach to model discrete trait with additive random effects.

For information about building access for persons with disabilities, please contact Matt Johnston at 773.702-0541 or send an email to mhj@galton.uchicago.edu. If you wish to subscribe to our email list, please visit the following web site: <https://lists.uchicago.edu/web/arc/statseminars>.