

DISSERTATION PROPOSAL PRESENTATION

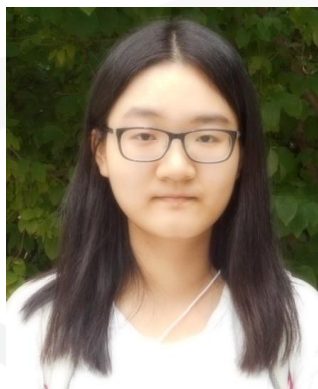
Testing for Interaction in a GWAS Context

WHEN

December 7, 2021
3:00 PM, CST

WHERE

Jones Laboratory, Room 304

**Huanlin Zhou, PhD candidate**

My project concerns detecting epistasis in a GWAS context (and it could also apply to detecting gene x environment interaction in a GWAS context). In some very simplified GWAS settings, we consider the null distribution of the usual t-statistic for epistasis (or gene x environment interaction), and we find that in the GWAS context, it may be necessary to apply a different null conditional distribution to obtain correct type 1 error, even if we make the simplifying assumption that genome-wide SNPs are independent. We are exploring this issue and figuring out how to solve it.

At the next level, we consider the problem of applying a suitable global testing approach to detect "marginal epistasis" (as defined by Crawford et al. 2017), where this basically means that in the model for a given phenotype, we fix one SNP and do a global test of the null hypothesis that the SNP doesn't interact with any other SNPs in the genome vs. the alternative that it interacts with at least one other. We propose global testing approaches that could hopefully improve power and correct potentially serious type 1 error problems that we identified in previous work.

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