Association Mapping: GWAS and Sequencing Data

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Introduction: Course Aims

This is a course on statistical methods and software for genetic association studies of complex traits. We aim to cover:

▶ Case-Control Association Testing
▶ Genetic Association Testing with Quantitative Traits
▶ Gene and Pathway Level Analysis
▶ Population Structure/Ancestry Inference
▶ Genetic Association Testing in Samples with Structure
▶ Interaction Analysis
▶ Collapsing Tests for Rare Variant Analysis
▶ Kernel Tests and Omnibus Tests for Rare Variants
▶ Power and Sample Size, Design Considerations, Emerging Issues
Introduction: Resources

Importantly, the class site is:


Contains (or will contain):

▶ PDF copies of slides (in color)
▶ Datasets needed for exercises
▶ Exercises for you to try
▶ Our solutions to exercises (later!)
▶ Links to software packages
Introduction: About Mike

- Associate Member, FHCRC Public Health Sciences Division
- Affiliate Associate Professor, UW Boistatistics
- Research in:
  - High dimensional data
  - Kernel machine methods
  - Variable selection and regularization
  - Pathway and network based analysis
  - Translational research
  - Statistical genomics/genetics
Introduction: About Tim

- Associate Professor, UW Biostatistics
- Affiliate Investigator, FHCRC Public Health Sciences Division
- Research in:
  Genetic Association Studies
  Methods for Correlated Genetic Data
  Inferring Genetic Ancestry
  Relatedness Estimation
  Pharmacogenomics

... and you?
Introduction: Course Structure

- 10 sessions over 2.5 days
- What to expect in a typical session;
  - 45 mins teaching/lecture
  - 30 mins hands-on exercises
  - 15 mins summary, discussion