Statistics 8625 (Autumn 2015)
Statistical Methods for Analyzing Genetic Data

Instructor	Prof. Shili Lin, 440A Cockins Hall, 2-7404, shili@stat.osu.edu
Lectures	MWF 1:50 PM - 2:45 PM; Scott Lab E103. No classes on September 7, October 16, November 11, 25, and 27
Office Hours	MW 10:00 AM - 11:00 AM, or by prior appointment
Grader	Han Zhang, MA 450, 292-9238, zhang.1125@osu.edu
Website	http://carmen.osu.edu
Course Requirements	You are responsible for: material covered in class, assigned readings, homework assignments, and project. Class attendance is required.
Topics	Overview and history - statistical genetics, omics and bioinformatics Basic principles of population genetics Gene/haplotype frequency estimation Likelihood computation on pedigrees (exact and Monte Carlo methods) Linkage analysis; lod score and identity-by-descent methods Association study; population and family based More advance topics (e.g. imprinting and maternal effects; rare variants) Topics in Bioinformatics (e.g. microarray/sequencing, methylation, data integration)
Homework	There are a total of 4-5 assignments. They are based on the materials covered in the lecture. No late homework will be accepted.
Midterm	TBA.
Project	The project is to read, summarize, and present a journal article. Novel ideas on extending statistical methodologies or improving computational algorithms will be awarded extra points. It is being structured into three parts: Part I: guided summary of paper; Part II: slide preparation; Part III: Presentation.
Grades	The final numerical grade will be determined as follows: Homework assignments 20% Midterm exam 30% Reading and participation in discussion 10% Project (including summary, slides, and presentation) 40%
References	Lange K (2003) *Mathematical and statistical methods for genetic analysis*, 2^{nd} Ed Lin S & Zhao H (2010) *Handbook on analyzing human genetic data* Ott J (1999) *Analysis of human genetics linkage* Thompson EA (2000) *Statistical inference from genetic data on pedigrees* Weir BS (2007) *Genetic Data Analysis 3* Balding D, Bishop M, Cannings C (2007) *Handbook of Statistical Genetics*, 3rd Edition.
Special Accommodations	If you need any accommodations based on the impact of a documented disability, contact the instructor privately to discuss your specific needs. You should also contact the Office of Disability Services to coordinate special accommodations.
Academic Misconduct	Academic misconduct will not be tolerated and will be dealt with in accordance with university policy.

Other Helpful Information

Full credit policy. Full credit for each homework or exam problem can only be earned through showing your justification for or work on each problem. Answers without work will not receive full credit.

Calculators. calculator (with statistical functions) may be used for homework and exams. No calculator functions of cell phones or other communication devices will be allowed during exams.

Communication devices. Cell phones and other communication devices must be either turned off or put on vibrate during class, as these devices ringing during class disrupt the learning process. Additionally, no cell phones or other communication device will be allowed on any exams in the course.