

Statistics 8810 (Autumn 2018)

BioData Mining Statistical and Learning Methods for High Throughput Genomic Data

Instructor	Prof. Shili Lin, 440A Cockins Hall, 2-7404
Lectures	TR 11:30 am – 12:25 pm, Baker Systems 272
Office Hours	TBA
Website	http://carmen.osu.edu
Prerequisites	Statistics 6801 and 6802 or equivalent
Course Description	This class will discuss a number of statistical methods and case studies in genomics (e.g. genetic and epigenetic studies).
Learning Objectives	Develop technical skills for working with high throughput genomic data; understand the theory and applications of high-dimensional statistical and learning methods pertinent for analyzing high-dimensional genomic data.
Tentative Topics	Clustering and classification; Graphical Lasso and other graphical models; High-dimensional mixture models for quantitative and survival traits; Kernel machine regression; Lasso, Bayesian Lasso, and other methods for sparse features; Non-parametric and Bayesian methods for rank aggregation; Shrinkage estimation for differential analysis; Zero inflation modeling.
Homework	There are several sets of homework and reading assignments. For reading assignments, brief reports are expected. You may discuss with other students, but DO NOT simply copy any part of someone else's work or report.
Class Participation	Students are expected to actively participate in class discussions. Class attendance and participation will be taken into consideration in assigning grades.
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: summary of paper; Part II: slide preparation; Part III: Presentation.
Grading	The final numerical grade will be determined as follows. Homework, class participation, and attendance 50% Project 50%
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 procedurally in accordance with university policy.