

Course Information for 22S:248 (STAT:7400) Computer Intensive Statistics

Semester: Spring 2010

Lectures: MWF 10:30PM – 11:20PM

Room: Schaeffer 30

Instructor: Luke Tierney, Schaeffer 241, luke@stat.uiowa.edu.
Office Hours MWF 9:30PM – 10:20PM or by appointment.
Web Page: <http://www.stat.uiowa.edu/~luke/classes/248>
DEO: Luke Tierney, 241 SH, 335-3386

Outline

The goal of this course is to develop skills, knowledge, and tools useful in applying modern computationally intensive statistical methods to research in any field. Topics will be selected from random variate generation, design and analysis of simulation experiments, optimization algorithms for model fitting, bootstrap, Markov chain Monte Carlo, smoothing, machine learning and data mining, and graphical methods. Most topics will be presented in the context of the R statistical computing language.

Prerequisites

The prerequisites for this course are 22S:164 (STAT:5200) or 171:201 (BIOS:5610) and proficiency in Fortran or C or C++ or Java. These prerequisites imply a basic familiarity with mathematical statistics.

Reading and Homework

Homework assignments consisting of a mix of computational and theoretical problems will be given roughly every two to three weeks. Some problems will cover material not addressed in class and may require additional reading. Assignments will be posted on the class web site. Suggested reading will also be posted on the class web site when appropriate, but you should also seek out and explore relevant references on your own. Assignments will need to be submitted electronically. Many students find that these assignments take up to 20 hours to complete, so plan your time accordingly.

Class Project

Students registered for this class are expected to complete a class project. Your project should represent about 20 hours of work on a topic of your choice that involves computation. You should start to think about the topic as soon as possible. You might investigate properties of a methodology you find interesting, you might compare several methods on a variety of problems; there are many choices for the topic of your project. The project should represent new work, not something you have done for another course or as part of your thesis.

A proposal for your project is due on Friday, March 26. The proposal should be at most two pages long. A final report on your project is due on Friday, May 7. The

report should be three to five pages in length, excluding any appendices you wish to attach, and must be submitted electronically. Your project will be shared with the class through the class web page.

Grading

The course grade will be based on assignments and the class project. You may discuss general issues and approaches with your fellow students, but your work must be your own. If you use any references, including solutions to similar problems prepared by other students, you *must* cite and credit your sources.

EMail and World Wide Web

Announcements on changes or clarifications of assignments or other matters may be sent by email to your class account or posted on the class web page. You should check the class home page and your class email account regularly. You can arrange to forward your class email to another address if you wish.

College of Liberal Arts and Sciences: Policies and Procedures

Administrative Home of the Course

The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed in 120 Schaeffer Hall or see the CLAS Student Academic Handbook: www.clas.uiowa.edu/students/academic_handbook/index.shtml

Electronic Communication

University policy specifies that students are responsible for all official correspondences sent to their standard University of Iowa e-mail address (@uiowa.edu). Students should check this account frequently. (Operations Manual, III.15.2. Scroll down to k.11.)

Academic Fraud

Plagiarism and any other activities when students present work that is not their own are academic fraud. Academic fraud is a serious matter and is reported to the departmental DEO and to the Associate Dean for Undergraduate Programs and Curriculum. Instructors and DEOs decide on appropriate consequences at the departmental level while the Associate Dean enforces additional consequences at the collegiate level. See the CLAS Student Academic Handbook: www.clas.uiowa.edu/students/academic_handbook/ix.shtml

Making a Suggestion or a Complaint

Students with a suggestion or complaint should first visit the instructor, then the course supervisor, and then the departmental DEO. Complaints must be made within six months of the incident. See the CLAS Student Academic Handbook:

www.clas.uiowa.edu/students/academic_handbook/ix.shtml#5

Accommodations for Disabilities

A student seeking academic accommodations should first register with Student Disability Services and then meet privately with the course instructor to make particular arrangements. www.uiowa.edu/~sds/

Understanding Sexual Harassment

Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Comprehensive Guide on Sexual Harassment at

www.uiowa.edu/~eod/policies/sexual-harassment-guide/index.html

for assistance, definitions, and the full University policy.

Reacting Safely to Severe Weather

In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. (Operations Manual, IV.16.14. Scroll down to e. h. and i.)

Student Classroom Behavior

The ability to learn is lessened when students engage in inappropriate classroom behavior, distracting others; such behaviors are a violation of the Code of Student Life. When disruptive activity occurs, a University instructor has the authority to determine classroom seating patterns and to request that a student exit the classroom, laboratory, or other area used for instruction immediately for the remainder of the period. One-day suspensions are reported to appropriate departmental, collegiate, and Student Services personnel (Office of the Vice President for Student Services and Dean of Students).