AMS 597: Statistical Computing

Pei-Fen Kuan (c)

Applied Math and Stats, Stony Brook University

Course Info

- Instructor: Pei-Fen Kuan, Ph.D, (peifen.kuan@stonybrook.edu)
- TAs: Benjy Hechtman (benjamin.hechtman@stonybrook.edu)
- David Zhao (david.zhao.1@stonybrook.edu)

Course Info

- Office Hours
  - Pei-Fen Kuan (tentative): Tue/Thu 03:45-5:00 PM via Zoom
  - TA: Benjy Hechtman (tentative): Mon/Wed 11:00-12:30 PM via Zoom
  - TA: David Zhao (tentative): Mon/Wed 09:30-11:00 AM via Zoom
- Course materials will be posted on Brightspace

Recommended textbooks

- Introductory Statistics with R (2nd ed.), by Peter, Dalgaard, Springer. ISBN # 9780387790534
- Modern Applied Statistics with S, by Venables, W.N. and Ripley, B.D, Springer. ISBN # 9780387954578
- Computational Statistics (2nd ed.), by Geof H. Givens and Jennifer A. Hoeting, Wiley. ISBN # 9780470533314
- Statistical Computing with R, by Maria L. Rizzo, CRC Press. ISBN # 9781584885450
- Applied Statistics and SAS Programming Language (5th ed.), by Cody, Ronald P. and Smith, Jeffrey K., Prentice Hall. ISBN # 9780131465329

Course objectives

- This course introduces graduate students to some basic elements of statistical computing and computational statistics.
- Students are expected to know statistical concepts including ANOVA, regression analysis, etc before taking the course.
- This course is divided into two main parts. The first part covers R implementation of important statistical models.
- The second part covers computational statistics including numerical analysis, Monte Carlo methods, bootstrap, permutation, etc.

Homework

- Homework Assignments: Given regularly; no late homework will be accepted. Homework will be submitted online via Brightspace.
- Homework Policy: You may discuss problems with other students in this class, but you must write up your HW completely on your own; if you do work with other student(s), you must declare this on the cover of your own HW, giving names of your collaborators. (Your writings must be independent: Do not look at another write up, either of classmate or of anything you found on internet when writing your own solution. To do otherwise is a case of Academic Dishonesty and is subject to University policy through CASA.)

Grading

- There will be multiple in class quizzes/tests (given during lecture time regularly).
- There will be a project for this course. The project will involve reading an assigned scientific paper or chapters of a book, implement the method in the assigned reading on your simulated data and finally wrapping the project as a complete R package with simulated data, example data and help files. (More information will be provided later).
- The homework will count for 30% of the grade, tests will count for 40% of the grade, project will count for 30% of the grade.

Laptop and exams requirement

- Please bring your laptop to class so that you can work on the examples given during lecture.
- For quiz/test, please ensure that your laptop is fully charged.
- During quizzes/tests, if the problems require you to analyze a dataset from a given link, you will need to download the dataset to your local drive (on your laptop) during the first 5 minutes.
- The wi-fi has to be turned off subsequently for the entire quiz/test duration.
- You will only turn on the wi-fi at the end of quiz/test to submit your solution.

Critical Incident Management

- Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Student Conduct and Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.

Student Accessibility Support Services (SASC):

- If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at sasc@stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Academic Integrity

- Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html

Testing Brightspace

- Homework submission. Please check Brightspace for instruction on a dummy homework to ensure that students are able to submit homework assignments successfully.
- Zoom and Echo360.