California State University, Long Beach, Dept. of Math and Stat

STAT 572, Computational Statistics

Note: Request for special need for accommodation of a University verified disability should be submitted within the first two weeks with all necessary documentation. If you received permission to register for a closed class section, only you can enroll for the course. It is the student's responsibility to complete the registration process before the dates indicated in the *Schedule of Classes*.

Instructor: Prof. Sung Kim, FO3 206, e-mail skim43@csulb.edu, phone 54320,
office hours TTh 2:30-4:00.
Any office hour may be canceled due to illness or necessary appointments, and students should not therefore depend on the faculty being in his office for a particular office hour. Students thus should secure any necessay signatures or other requirments well in advance of any deadline.

Lecture: Th 5:30-8:15PM, LA5 349, course web **http://www.csulb.edu/~skim43/stat572/stat572.htm**

Goal: Computational Statistics is an important area of specialization in statistics that includes statistical visualization and other computationally-intensive methods of statistics. The students should gain deep insights into existing computational statistics methods to develop the skills to use them in statistical applications. Potential topics include: random number generation, sampling and subsampling, exploratory data analysis, Markov Chain Monte Carlo methods, density estimation and EM algorithm. Topics of current interest. MATLAB for window will be used during the course. No programming experience is required.

Textbooks:
Required: Martinez W.L and Martinez A.R. (2008) Computational Statistics Handbook with MATLAB, 2nd ed., Chapman & Hall/CRC (ISBN 1-58488-566-1)
We will cover Chapter 2, 3, 4, 5, 7, 9, and 14.

Recommended: Givens G.H. and Hoeting J.A. (2005) Computational Statistics, Wiley

Homework assignments: About seven homework (one each chapter) will be assigned. The problem sets and due dates will be distributed during class.

Exams: We will have two take-home exams. Tentative schedule for the exams due is TBA

Grading:

- 40% homework
- 30% Exam I (take-home)
- 30% Exam II(take-home)

The distribution of the grades will follow a curve.

Outline (tentative)

- Probability and Sampling concepts and introduction to MATLAB
- Generating continuous and discrete random numbers
- Exploratory Data Analysis
- Monte Carlo methods for statistical inference
- Kernel density estimation and finite mixtures
- Markov chain and Monte Carlo methods