Course Syllabus

STAT 516: Stochastic Modeling of Scientific Data
Autumn 2019

Instructor: Yen-Chi Chen
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Office hours: Wednesday 2 pm – 3 pm at PDL B-312.

Teaching Assistant: Rahul Biswas
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Office hours: Tuesday 11am –12 pm at PDL C-302.

Course Website:
On Canvas: https://canvas.uw.edu/courses/1225420.

Class Schedule: There will be two sessions a week:
  • (Lecture) TTh, 2:30-3:50 PM in SAV 166.

Course Overview: The main theme of this course is Markov chain and its applications in Statistics and Scientific Modeling. The first part of this course is about the mathematical framework of probability models associated with Markov chain. The later part will be applications of Markov chain in various data analysis problems.

Course contents:
  • Review on probability and statistics
  • Graphical and network models
  • Discrete-Time Markov chain
  • Review on statistical inference
  • Inference on Markov chain
  • Monte Carlo methods
  • EM algorithm and gradient descent methods
  • Missing data and causal inference
  • Hidden Markov model

Prerequisites: You need to be very familiar with calculus, linear algebra, and basic probability/statistics. Also you need to have a good sense of mathematical analysis. There will be a couple of mathematical proofs in the lecture/homework.

Grades:
  • Homework assignments (50%)  
  • Midterm exam (25%) 
  • Final exam (25%) 

Course Textbook: No required textbook.  
However, you may find the following two books useful:

Schedule
  • Midterm exam: Oct. 29 (Tuesday) at class time (2:30 - 3:50 PM) at classroom (SAV 116).
  • Final exam: Dec. 10 (Tuesday) 4:30 – 6:20PM at SAV 116.
Accommodation. Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW’s policy, including more information about how to request an accommodation, is available at Religious Accommodations Policy. Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request form.