



Statistics 542

Spring 2014

Course Description: Bayesian Methods and Computation

The goal of this course is to develop sophisticated tools for probability modeling and data analysis from the Bayesian perspective. Key topics covered in the course include hierarchical models, mixture models and Monte Carlo simulation techniques.

Prerequisites: Probability (Statistics 430, 510 or equivalent) or permission of instructor. Statistics 541 is also highly recommended but not required.

Professor:

Dr. Shane Jensen
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JMHH 463
215-573-2211

Lectures: TTh 10:30-12:00 Location TBA

Required Textbook:

Bayesian Data Analysis (3rd Edition) by Gelman, et.al.

Required Software:

The R statistical package is needed and can be downloaded at www.r-project.org

Course Topics

1. Introduction to Bayesian Inference (Ch.1)
2. Simple Parametric Models (Ch. 2, 3)
3. Regression Models from the Bayesian Perspective (Ch. 14,15)
4. Hierarchical and Mixture Models (Ch. 5)
6. Optimization Algorithms for Model Estimation (Ch. 13)
7. Monte Carlo Simulation Algorithms for Model Estimation (Ch. 10,12,13)
8. Model Checking (Ch. 6,7)
10. Nonparametric and Semiparametric Bayesian models (Ch. 23)
11. Hidden Markov Models

Other Course Information

Office hour: Tuesday 4:00-5:00pm JMHH 463

Course Website: stat.wharton.upenn.edu/~stjensen/stat542.html

Evaluation:

Your course grade will be calculated from homeworks. Homework assignments will be assigned every three weeks or so and will be turned in for grading. ***No late homework will be accepted, for any reason whatsoever.***

Important Dates:

Thursday, January 16

Tuesday, March 11

Thursday, March 13

Tuesday, April 29

First day of class

No Class -- Spring Break

No Class -- Spring Break

Last day of class