ISyE 6420 A/MSA: Bayesian Statistics
Spring 2020

Instructor   : Dr. Roshan Joseph
          334 Groseclose Building
          Email: roshan@gatech.edu, Phone: 404 894 0056
Time/Location   : 10:10-11:00 AM on MWF in MRDC 2404
Office Hours   : M 11:00 AM -12:00 PM or by appointment
TA   : Mr. Arvind Krishna, akrishna39@gatech.edu
          Office hours: TBA.

Prerequisite: Knowledge in statistics (e.g., ISyE 6412) and probability (e.g., ISyE 6650).

Course Outline

Theory: Basics of Bayesian inference, Conjugate prior, Noninformative prior, Hypothesis testing, Regression models, Empirical Bayes methods, and Hierarchical models.

Computation: Laplace's approximation, Monte Carlo and Quasi-Monte Carlo methods, Markov Chain Monte Carlo methods: Metropolis-Hasting Algorithms and Gibbs sampling, and other advanced approximation methods.

Applications: Linear regression, nonlinear regression, generalized linear models, random effects models, Gaussian process models, and Bayesian optimization.

References:
1. Peter D. Hoff (2009) *A First Course in Bayesian Statistical Methods*, Springer.
2. P. M. Lee (2004) *Bayesian Statistics: An Introduction*, 3rd Edition, Hodder Arnold.
3. Prof. Vidakovic's 6420 website: https://www2.isye.gatech.edu/~brani/isye6420/

Software: R.

Grading:

	Section A	Section MSA	
Homework	25%	25%	
Midterm Exam	25%		March 4
Project		25%	Report: 04/20, Presentation: TBA
Final Exam	50%	50%	April 29, 8:00-10:50 am

GT Honor code: Please make sure that you are aware of the honor code by visiting https://osi.gatech.edu/content/honor-code. In this course, you are allowed to work together in the homework, as long as you write up and turn in your own solutions including the computer codes.
Disability Services: For information on Disability services, please visit http://disabilityservices.gatech.edu.