WSS Short Course
Practical Bayesian Computation

Date: Friday, October 12, 2018
Time: 9:00 am – 4:30 pm
Instructor: Dr. Fang Chen, SAS Institute Inc.
Place: Bureau of Labor Statistics
Conference rooms 7&8, 2 Massachusetts Avenue NE, Washington, DC

Course Content:

This course reviews the basic concepts of Bayesian inference and focuses on the practical use of Bayesian computational methods. The objectives are to familiarize statistical programmers and practitioners with the essentials of Bayesian computing, and to equip them with computational tools through a series of worked-out examples that demonstrate sound practices for a variety of statistical models and Bayesian concepts.

The first part of the course will review differences between classical and Bayesian approaches to inference, fundamentals of prior distributions, and concepts in estimation. The course will also cover MCMC methods and related simulation techniques, emphasizing the interpretation of convergence diagnostics in practice.

The rest of the course will take a topic-driven approach that introduces Bayesian simulation, analysis, and illustrates the Bayesian treatment of a wide range of statistical models using software with code explained in detail. The course will present major applications areas and case studies, including multi-level hierarchical models, multivariate analysis, non-linear models, meta-analysis, latent variable models, and survival analysis models. Special topics that are discussed include Monte Carlo simulation, sensitivity analysis, missing data, model assessment and selection, variable subset selection, and prediction. The examples will be done using SAS (PROC MCMC), with a strong focus on technical details.

About the Instructor:

Dr. Fang Chen is Director of Advanced Statistical Modeling in Advanced Analytics Division at SAS Institute Inc. Among his responsibilities are development of Bayesian analysis software and MCMC procedure. He has written extensively about Bayesian modeling using SAS and presented numerous tutorials and short courses in Bayesian methods, applications, and software at professional conferences, companies, universities, and SAS User Group meetings. Dr. Chen also oversees software development in nonlinear models, nonlinear random-effects models, and Bayesian capabilities in areas such as generalized linear models, survival analysis, hierarchical models, and discrete choice models. Prior to joining SAS Institute, he received his PhD in statistics from Carnegie Mellon University in 2004.

Course Schedule:

8:15 - 9:00 Coffee, breakfast, and check in

9:00 - 9:15 Introduction & Welcome

9:15 – 10:15 **Part I – Background and Concepts in Bayesian Methods**

A. Concepts in Bayesian Methods
B. Computational Methods (MCMC)
C. Convergence Diagnostics

10:15 - 10:30 Break

10:30 - 11:00 **Part II - Primer on PROC MCMC**

11:00 - 12:00 **Part III - Models and Applications**

A. Monte Carlo Simulations
B. Single-level Models
C. Generalized Linear Models
D. Nonlinear Models
E. Posterior Predictive Distribution
F. Use of Historical Data

12:10 - 1:00 Lunch (provided)

1:00 - 2:30

G. Multilevel/Random-Effects Models
H. Latent Variable Models

2:30 - 2:45 Break

2:45 – 4:30

I. Model Selections
J. Missing Data Analysis
K. Survival Analysis

Advance registration: In addition to your RSVP here, please go to https://www.eventbrite.com/e/wss-short-course-practical-bayesian-computation-tickets-49597898650 to register and pay for the class. Online registration will close on October 10, 2018; earlier if the course fills up.

Registration Fee:

Full-time students (at most 8): $63.49 advance, $80 at the door
WSS members: $186.49 advance, $200 at the door
All others: $217.24 advance, $240 at the door

Contact person: Yang Cheng, 301-763-3287, yang.cheng@census.gov