MKT6v99.002 Special Topics:
Bayesian Dynamic Models in Marketing

Instructor: Dr. Norris Bruce, PhD
Meeting Time: Mon. 2:30-5:15pm
Class Room: SOM 13.510
Office Hours: Tuesday 5:00pm-7:00pm, by appointment
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Course Description

This course is an advanced PhD seminar that introduces students to Sequential Monte Carlo (SMC) methods. Its objective is to help you learn how to develop, estimate, and assess these dynamic models; and how to add to the marketing dynamics literature. Students should already have some course work in econometrics and/or statistical inference.

Recommended Textbooks

General Bayesian Statistics:

Peter E. Rossi, Greg M. Allenby, Rob McCulloch (2005), *Bayesian Statistics and Marketing*.

Dynamic Linear Models:
Petris, Petrone and Campagnoli (2009), *Dynamic Linear Models with R. Springer*.

Dynamic Non-Linear Models:

Course Requirements:

Course Project: The purpose of the project is to have you apply some of the techniques covered in the course to a substantive marketing problem. My hope is that some of your ideas will eventually be publishable. Please submit a two-page report that explains the potential problem you want to work on, the plans for collecting the data, and the modeling approach you hope to take. The project consists of three deliverables: 1) manuscript; 2) copy of your code (properly documented), tested with simulated data; and 3) a 30-minutes presentation that should include a description of your problem, data, model, estimation (inference and checking) and results.

Weekly Schedule, Topics and Readings

Readings with asterisks are recommended, not required.

Week 1: Course overview; introduction to Bayesian Dynamic Models

Week 2: Bayesian Dynamic Linear Model


Week 3, Mar. 2: Dynamic Factor Models


Week 4: Hierarchical DLM and its applications


Week 5: Dynamic GLMS and Conditional Models (I)


Week 6: Dynamic GLMS and Conditional Models (II)


Week 7: Latent Variable Approach to IV’s in DLMs
Bayesian instrumental variables pp183-187: Bayesian Statistics and Marketing, Rossi et al.


Week 8: Nonlinear Filters
*Understanding the Extended and Unscented Kalman Filters: in Beyond the Kalman Filter, Ristic et al (2004).


Week 9: The Ensemble Kalman Filter


Week 10: High Dimensional Sparse Models


Week 11: Nonparametric Dynamic Models


**Final Project Presentations:**
Submit: Project Report; Code; and Data