STAT 890

Summer 2009

Selected Topics: Statistical Methods for Dynamic System Models

Day Course

Students requiring accommodations as a result of disability, must contact the Centre for Students with Disabilities 778-782-3112 or csdo@sfu.ca

Instructor: Dr. David Campbell

Textbook:
No book required

Course Outline:
Course work will be partly based on group projects providing opportunity for students in statistics and differential equation modelers from other departments to collaborate and learn from each other. The course will be held in inter-session 2009. This is a 4 credit graduate statistics course to be held in a short semester spanning May 4th until May 28th 2009 and will be held the Burnaby campus of SFU. Classes will meet daily for a total of 3 hours per week. Students may also be interested in attending the Workshop on Statistical Methods for Dynamic System Models which will be held at SFU Harbour center on June 4-6, 2009 http://www.stat.sfu.ca/~dac5/workshop09/Welcome.html There are no official prerequisites for statistics graduate students. Students from other departments should have a background in 2 or more of: ODE models, optimization, stochastic processes, probability theory. Students from other departments are encouraged to contact the instructor before enrolling in the course.

The approximate outline is:

Week 1
Matlab Software
basics of differential equation models
basic of ODE solvers
Nonlinear least squares
Bayesian basics
computational Bayesian basics:
MCMC, Metropolis Hastings, Gibbs sampler, importance sampling

Main goal of the week is to understand some background and see where the 'basics' work and where they break down. This really set the stage for the fancier tools and methods of the next weeks.

Week 2
This week focuses on online estimation
Difference equations and state space models
Kalman filtering
Multiple iterated filtering
Sequential monte carlo
Sequential data assimilation

Schedule (Room K9509):
Monday: 10:00 to 12:00
Tuesday: 10:00 to 12:00 & 2:00-3:30
Wednesday: 10:00 to 12:00
Thursday: 10:00 to 12:00 & 2:00-3:30
Friday: 10:00 to 12:00

Grading Scheme:
Assignments: 70%
Final Project: 30%

Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester. Students are reminded that Academic Honesty is a cornerstone of the acquisition of knowledge. Scholarly integrity is required of all members of the University. Please consult the General Guidelines of the calendar for more details.

Revised April 2009