Colloquium announcement

"Parameter inference and model selection in deterministic and stochastic dynamical models"

Presented by
Jennifer Hoeting, Colorado State

Thursday, April 13, 2017
300 Seitz Hall
3:30 p.m.

Abstract: We propose new methodology to estimate parameters in a dynamical model when some state variables are unobserved and observed states are sparse over time. The talk is in two parts. First, we consider the problem of estimating parameters of stochastic differential equations (SDEs) with discrete-time observations that are either completely or partially observed. We propose an importance sampling approach with an auxiliary parameter which improves the approximation of the transition density. We embed the auxiliary importance sampler in a penalized maximum likelihood framework which produces more accurate and computationally efficient parameter estimates. In the second part of the talk we perform model selection when observations from dynamical model are assumed to be observed with error (i.e., a statistical model). We select the form of the dynamical model (ODE, SDE, and a continuous time Markov chain model) as well as the form of the statistical model. Model selection and parameter estimation are performed using an ABC-SMC algorithm. We show these methods have good properties and apply these new approaches to two epidemics of chronic wasting disease in mule deer. This is joint work with Libo Sun and Chihoon Lee.

Hosted by the
Department of Statistics
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Please join us after the colloquium for refreshments at
Top of the Stairs (217 College Ave.)