Submittee: Gemai Chen
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Title: The 36th Annual Meeting of Alberta Statisticians
Event Type: Conference-Workshop

Location:
CAB 528 (Central Academic Building, 5th floor, Room 528),
Department of Mathematical and Statistical Sciences, University of Alberta

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Dates:
Saturday, October 18, 2014

Topic:
Bayesian Optimal Design of Disease Transmission Experiments (and Other Issues in Disease Modeling)

Dependent Extremes

Beyond Mode Hunting

Change Detection for Time Series Following Generalized Linear Models

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Organizers:
CHEN, Gemai, Dept of Mathematics and Statistics, University of Calgary

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Speakers:
Dr. Rob Deardon, Associate Professor of Biostatistics
Department of Production Animal Health, Faculty of Veterinary Medicine and Department of Mathematics & Statistics, Faculty of Science, University of Calgary
Title: Bayesian Optimal Design of Disease Transmission Experiments (and Other Issues in Disease Modeling)

Abstract: Of interest here is the issue of experimental design for animal disease transmission experiments, where the underlying goal is to identify some characteristic of the underlying infectious disease dynamics (e.g. the transmission rate, a vaccine effect, or the infectious period). Mechanistic disease transmission models are often necessary to analyze such data. However, design for non-linear models such as these is complicated by the fact that the optimal design depends upon the parameters of the model. As such, a Bayesian framework using informative priors is a natural setting for such design problems. Generic results are hard to formulate for such systems with results being highly dependent upon the system being observed, the models to be fitted, the characteristic(s) of the system to be identified, and, of course, the parameters. This means that the application under study is key. Analytically tractable results are also rare in this field with resort to Monte Carlo methods being common. Therefore, fast simulation is also of great importance. Here

we consider some issues related to designing such experiments and (time permitting) discuss other issues of current interest in infectious disease epidemiology.

Dr. Gemai Chen
Professor, Department of Mathematics and Statistics, University of Calgary
Title: Dependent Extremes
Abstract: The literature on extreme values is rich when the extremes are independent or asymptotically independent. When the extremes are dependent, not much experience is available, especially for finite sample data analysis. This talk reports some results obtained in studying finite sample dependent extremes.

Dr. Giseon Heo
Departments of Dentistry and Mathematical and Statistical Sciences, University of Alberta
Title: Beyond Mode Hunting
Abstract: The scale space has been studied in the context of blurring in computer vision, smooth curve estimation in statistics, and persistent feature detection in computational topology. We review the background of three approaches and discuss how persistent homology can be useful in high dimensions.

Dr. Edit Gombay
Department of Mathematical and Statistical Sciences, University of Alberta
Title: Change Detection for Time Series Following Generalized Linear Models
Abstract: The models considered in this talk are of great practical importance as they are used in measuring health care performance, evaluating financial markets, analysing industrial processes, and in climate studies. We survey recent theoretical developments concerning logistic and other regression models that allow AR(p)-type dependence structure together with the presence of covariates. Conditions are set for the Maximum Partial Likelihood Estimatorâ€™s existence and its convergence to the true value. We can prove that this convergence is at the optimal rate. The performance of the score vector of the partial likelihood function is analysed. We can use it for change detection and in sequential monitoring. Its usefulness will be demonstrated on data from clinical studies.

Links:

File Uploads:
Additional Upload 1: http://www.pims.math.ca/files/final_report/Report.pdf

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