

國立中山大學應用數學系

學術演講

Speaker : Prof. Kerby Shedden

Department of Statistics, University of Michigan
Ann Arbor, USA

Title : Constructing interpretable parameter estimates in
complex models using inverse regression and
Approximate Bayesian Computation

Time : 2014/02/27 (Thu., 星期四) 15 : 30 ~ 16 : 20

Place : 理學院 4 樓理 4009-1 室

Tea Time : 15:00~15:30 於系辦公室(理 4010 室)

Abstract

Approximate Bayesian Computation (ABC) is an approach that allows summary statistics to be used to estimate parameters in statistical models. An attractive aspect of ABC is that it provides insight into how interpretable summary statistics such as moments and quantiles can be used to estimate a parameter for which optimal estimators exist only in numeric form. In the first part of the talk, I will review ABC, and discuss how inverse regression can be used to construct interpretable estimators based on sample quantiles. Then, we apply ABC methods to the problem of estimating the distribution of glomerular radii based on needle biopsies of kidney tissue. The raw data in this application are measurements of the radii of a collection of random cross-sections of the glomeruli. These cross-sections underestimate the full hemispheric radius, so adjustments based on simple geometric probability calculations are usually made. However, such adjustments are difficult to apply when the glomeruli have varying sizes. Using ABC methods we see that evidence for heterogeneity can be derived from various direct estimates of the location and scale of the measured partial radii.

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