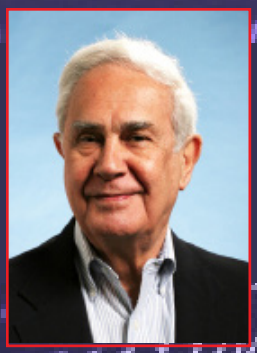

The Eleventh Annual
Distinguished Professor S. James Press
Endowed Lecture

Bayesian Model Selection in Generalized Linear Models

BY **Dr. MERLISE CLYDE**

PROFESSOR AND CHAIR

DEPARTMENT OF STATISTICAL SCIENCE

DUKE UNIVERSITY, DURHAM, NORTH CAROLINA

Tuesday, April 25, 2017

3:45 – 4:45 p.m.

PENTLAND HILLS - BEAR CAVE

Reception with light refreshments at 3:15 p.m.

University of California, Riverside • Department of Statistics

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Bayesian Model Selection in Generalized Linear Models

Abstract:
Bayesian variable selection and model averaging with two group prior distributions that include a point mass at zero with a continuous distribution have been shown to be optimal in a variety of settings. Of these, mixtures of Zellner's g-priors have had numerous desirable properties for both variable selection and Bayesian model averaging, including invariance and consistency for selection and estimation. Several variants of g-priors for Generalized Linear Models (GLMs) have been proposed in the literature; however, the choice of prior distribution of g and resulting properties for inference have received considerably less attention. We show how many of these priors may be unified through mixtures of g-priors in GLMs by adopting a truncated Compound Confluent Hypergeometric distribution for the shrinkage factor 1/(1+g). Under an Integrated Laplace approximation, the marginal likelihoods are functions of these special hypergeometric functions leading to "Compound Hypergeometric Information Criteria" for model selection that combine frequentist test statistics and penalties that depend on the model dimension. We discuss the local geometric properties of the priors in GLMs and show how desiderata for model selection, such as asymptotic model selection consistency, intrinsic consistency, predictive matching, and measurement invariance may be used to justify the prior and choices of the hyper-parameters. We provide illustrations on several real and simulated examples and conclude with open questions.

Bio:
Dr. Clyde's research interests are in the areas of: Model uncertainty and choice in prediction and variable selection problems for linear, generalized linear models and multivariate models; Bayesian Model Averaging; Prior distributions for model selection and model averaging; Wavelets and adaptive kernel non-parametric function estimation; Spatial statistics; Experimental design for nonlinear models; Applications in proteomics, bioinformatics, astro-statistics, air pollution and health effects, and environmental sciences.

Dr. Clyde received her Ph.D. from the University of Minnesota, Twin Cities, in 1993. She is an alumna of the University of California, Riverside, where she received her M.S. in 1988. She also received her M.S. from the University of Alberta, Canada in 1986, and her B.S. from Oregon State University in 1985.