Seminars on Statistics in Marketing and Psychology, Autumn 2008

Research seminars in Marketing, Psychology and Statistics on THURSDAYS 10.30-11.50am this term, in Cockins Hall 240.

These seminars will consist mainly of ongoing research presentations and discussions of published papers. You are welcome to join us.

LIST OF SEMINARS

October 9, Tom Bishop and ,Nationwide Analytics Lab

October 16: Elly Kaizar, Statistics Department
A discussion of the paper "Using Wavelet-Based Functional Mixed Models to Characterize Population Heterogeneity in Accelerometer Profiles: A Case Study", by Morris, Arroyo, Coull, Ryan, Herrick and Gortmaker

Abstract from the paper

We present a case study illustrating the challenges of analyzing accelerometer data taken from a sample of children participating in an intervention study designed to increase physical activity. An accelerometer is a small device worn on the hip that records the minuteby-minute activity levels throughout the day for each day it is worn. The resulting data are irregular functions characterized by many peaks representing short bursts of intense activity. We model these data using the wavelet-based functional mixed model. This approach incorporates multiple fixed-effects and random-effects functions of arbitrary form, the estimates of which are adaptively regularized using wavelet shrinkage. The method yields posterior samples for all functional quantities of the model, which can be used to perform various types of Bayesian inference and prediction. In our case study, a high proportion of the daily activity profiles are incomplete (i.e., have some portion of the profile missing), and thus cannot be modeled directly using the previously described method. We present a new method

October 23: Greg Allenby, Marketing Department
"Choice Models in Marketing: Economic Assumptions, Challenges and Trends"

Abstract: Direct utility models of consumer choice are reviewed and developed for understanding consumer preferences. We begin with a review of statistical models of choice, posing a series of modeling challenges that are resolved by considering economic foundations based on constrained utility maximization. Direct utility models differ from other choice models by directly modeling the consumer utility function used to derive the likelihood of the data through Kuhn-Tucker conditions. Recent advances in Bayesian estimation make the estimation of these models computationally feasible, offering advantages in model interpretation over models based on indirect utility, and descriptive models that

tend to be highly parameterized. Future trends are discussed in terms of the antecedents and enhancements of utility function specification.

October 30: No seminar

November 6: Yoonsuh Jung Statistics Department
"Regularization of Case-Specific Parameters for Robustness and Efficiency"
(joint work with Yoonkyung Lee and Steven MacEachern)

Abstract: Regularization methods allow one to handle a variety of inferential problems where there are more covariates than cases. This allows one to consider a potentially enormous number of covariates for a problem. We exploit the power of these techniques, supersaturating models by augmenting the "natural" covariates in the problem with an additional indicator for each case in the data set. We attach a penalty term for these case-specific indicators which is designed to produce a desired effect. For regression methods with squared error loss, an l_1 penalty produces a regression which is robust to outliers and high leverage cases; for quantile regression methods, an l_2 penalty decreases the variance of the fit enough to overcome an increase in bias. The paradigm thus allows us to robustify procedures which lack robustness and to increase the efficiency of procedures which are robust. We provide a general framework for the inclusion of case-specific parameters in regularization problems, describing the impact on the effective loss for a variety of regression and classification problems. We outline a computational strategy by which existing software can be modified to solve the augmented regularization problem, providing conditions under which such modification will converge to the optimum solution. We illustrate the benefits of including case-specific parameters in the context of mean regression and median regression through simulation and analysis of a linguistic data set.

November 13: Greg Allenby (Marketing Department), Peter Craigmile, Chris Hans, Juhee Lee, Steven MacEachern and Xinyi Xu, , Statistics Department
"SCUM: Scale-Usage Models"

This is a discussion of work in progress and the talk will be given by all the research team members!

November 20: Fangfang Sun, Statistics Department
"Unbalanced stated choice designs"

This talk will look at choice designs for the Bradley Terry model. A choice set consists of a subset of product alternatives and the respondent is asked to make a choice among these. An optimal design consists of all possible choice sets, but if this is not perationally feasible, the question becomes which choice sets should be included in the design. This will be explored under different

assumptions about the relative attractiveness of the product alternatives.

December 3: Jeff Dotson, Marketing Department
"A Probit Model with Structured Covariance for Similarity Effects and Source of Volume Calculations"