The 23rd New England Statistics Symposium

Department of Statistics, University of Connecticut

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mechanism governing speech sound production in humans. Results show that our hypothesis testing framework can reliably detect changes in the vocal tract parameters across multiple scales, thereby underscoring its broad applicability to speech analysis.

Interval estimation for the extra-dispersion parameter in count data based on parametric and semiparametric models

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There has been a continuous interest in the estimation of the extra-dispersion occurring in a variety of applications in biology, ecology, toxicology and other fields. Many authors have proposed different estimators for this parameter based on parametric as well as semiparametric models in terms of bias and efficiency property. However, there have always been reservations about the use of the confidence interval of this parameter of interest in the data analysis, partially due to the fact the estimating equations of this parameter based on the parametric and semiparametric models are nonlinear and hence it is not easy to find the exact distribution of the estimate of the extra-dispersion parameter. This article presents a simple and flexible approach based on parametric and semiparametric estimators to obtain the approximate confidence intervals of the extra-dispersion parameter. As assessed by Monte Carlo simulation, the coverage probability of the proposed approach is found to be very close to the nominal for small sample sizes. The method is applied to a set of cancer tumor data.

Comparing spatial statistical models for predicting tree diameter from airborne laser scanning data

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In the past tree height (h) has been more difficult to measure accurately in the field than tree diameter at breast height (dbh). As a consequence, models to predict h from dbh measurements (i.e. h-dbh models) have been widely developed in the forestry literature. Recently, through the use of airborne laser scanning technology (e.g., LiDAR), tree variables such as height (lh) and crown diameter (lcd) can accurately (mainly lh) be measured, a development which has spawned the need for models to predict diameter from airborne laser-derived measurements (i.e., dbh-LiDAR derived variables models). Although some work has been done for fitting dbh-LiDAR derived variables models, to date none have incorporated spatial information (i.e., location of trees) to improve the accuracy

of the predicted diameters. Using a simple linear model for predicting tree *dbh* from laser-derived tree height and crown diameter measurements, we compared the performance of ordinary least squares (OLS), generalized least squares with a non-null correlation structure (GLS), linear mixed-effects model (LME), and geographically weighted regression (GWR). Our data were obtained from 36 sample plots established in Norway. To our knowledge this is the first study to examine the use of spatial statistical models for LiDAR data. Prediction errors in tree diameter with LME (assuming the random effects are know) are around of 3.5%, while GWR are around 10%, compared to 17% if OLS is used. LME also had a fairly consistent (in the sense of low variability) good prediction performance across all the validation classes. Our results indicate that the LME model produced the best predictions of *dbh* from LiDAR-based variables to a degree that earlier has not been possible.

Design and analysis of analytical method transfer studies

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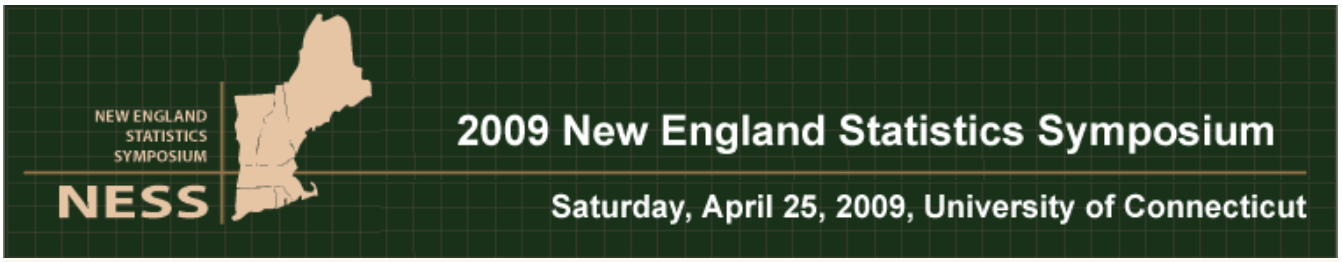
An analytical method transfer study is a GMP study deigned to demonstrate interlaboratory reproducibility in the transfer of manufacturing, testing or assay processes from one laboratory to another. The typical study involves two laboratories with two analysts within each laboratory, testing samples over a two day period. An equivalence testing strategy is employed to demonstrate the similarity of response obtained by the two laboratories. In the analysis of variance, laboratories are considered as fixed effects. The analysts within each laboratory are also considered fixed effects because they are trained technicians. Sampling day is considered a random effect.

Two issues are relevant to show reproducibility. The primary objective is to demonstrate that the laboratories produce equivalent results. Secondary objectives are to show that the laboratories are proficient in producing acceptable results and that the analysts within each laboratory are proficient in producing acceptable and equivalent results.

Depending on the pharmaceutical product involved, such as a capsule versus a solution versus a metered dose inhaler, different experimentation designs are necessary to accommodate the destructive sampling necessary for testing. The basic method transfer design will be discussed and an example presented.

This presentation is based on the publication "Design and Analysis of Analytical Method Transfer Studies. Journal of Biopharmaceutical Statistics, 18: 1013-1033, 2008."



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Welcome

The Department of Statistics of the University of Connecticut is proud to host The 23rd *New England Statistics Symposium* on Saturday, April 25, 2009. Our purpose is to bring together statisticians from all over New England to a central location to share research, discuss emerging issues in the field and network with colleagues.

James O. Berger of Duke University and Statistical and Applied Mathematical Sciences Institute and Richard A. Davis of the Department of Statistics at Columbia University will give the keynote talks. There will be several invited themed sessions in Applied Statistics, Bioinformatics and Genetics, Career Opportunities in Statistics, Probability and Statistical Education. Further details about these sessions will be posted in the Invited Sessions section of this website as the program is finalized.

In addition, there will be contributed paper sessions, allowing 15 to 20 minutes per paper. We invite talks on all aspects of statistics and probability. Reports on work in progress are welcome. To insure a place in these sessions, please submit an abstract as soon as possible, following the instructions in the Call for Papers section of this website. Participation of graduate students is encouraged. Students who present papers at the symposium will receive a waiver of the registration fee, and any student may submit a paper for consideration of one of three Student awards that are sponsored by the IBM T.J. Watson Research Center and Smith Hanley Associates LLC.

There will be a half day short course titled "Hierarchical modeling for spatially-referenced data with applications to environmental sciences and public health" presented by Professor Sudipto Banerjee, Division of Biostatistics, School of Public Health, University of Minnesota on April 24, 2009. Detailed information on the course can be found in the Short Course.

This year marks the 23rd anniversary of the New England Statistics Symposium. The first New England Statistics Symposium was held at the University of Connecticut. We have been continuing the tradition of hosting the Symposium on alternate years while inviting other institutions throughout New England to host it in years in between. For a list of previous host institutions and keynote speakers, click here.

The National Institute of Statistical Sciences (NISS) Affiliates Annual Meeting will be held in Storrs on April 24, 2009. Please go to the NISS page for the detail.

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