THE OHIO STATE UNIVERSITY

DEPARTMENT *of* STATISTICS NEWS

Volume 14, 2006

College of Mathematical and Physical Sciences

HIERARCHICAL BAYESIAN MODELING OF EXPOSURE PATHWAYS

A team of researchers from the Department of Statistics and Battelle is developing a hierarchical Bayesian modeling framework for analyzing pathways of exposure to toxic substances. Involved in the "Sources to Biomarkers" (STB) study have been four members of the Statistics faculty (Catherine Calder, Peter Craigmile, Noel Cressie, and Thomas Santner), three senior researchers from Battelle (Bruce Buxton, Nancy McMillan, and Michele Morara), and several current and former Ohio State Statistics Ph.D. students (Crystal Dong, Hongfei Li, Rajib Paul, Ke Wang, and Jian Zhang) and Battelle researchers (Vincent Agboto, Jessica Sanford, and Greg Young). Funding for the project resulted from a submission to the EPA's FY2003 STAR Grant program, which was jointly funded by the EPA's National Center for Environmental Research (NCER) and the American Chemistry Council (ACC).

Biomarkers
↑
Personal Exposure
↑
Local Environment
↑
Global Environment
↑
Sources

Characterizing routes of exposure to toxic substances is a difficult task. While levels of toxic substances in environmental media and in human biomarkers can be measured, large amounts of individual-level data are not readily available due to the burdensome nature of the data collection process. As a result, there is a need to supplement individual-level exposure data with additional sources of information such as spatially referenced measurements of the levels of toxics in environmental media. Bayesian hierarchical modeling allows these diverse data sources to be synthesized in a scientifically interpretable manner that accounts for all sources of uncertainty coherently.

The goal of the STB project is to develop a multi-scale (areal and individual) statistical model that describes how multiple media (e.g., air, soil, dust, food, water) contribute to direct routes of exposure (inhalation, ingestion, dermal). The hierarchical modeling framework includes five specific levels starting from sources of pollutants to the manifestation of the pollutants in human bodies, as measured by biomarkers.

While the structure of the STB modeling framework can be readily adapted to study exposure to a variety of pollutants, the current project focuses on four toxic metals (arsenic, cadmium, chromium, and lead) in EPA Region 5 (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin) and Arizona. These two regions coincide with the population surveyed by the National Human Exposure Assessment Survey (NHEXAS), a residential-based exposure survey conducted from 1995-1998. NHEXAS provides various biomarker and environmental media measurements for a stratified random sample of individuals who were monitored for a period of seven days. Additionally, demographic, occupational, and activity information, as well as food diaries for the participants are provided. These

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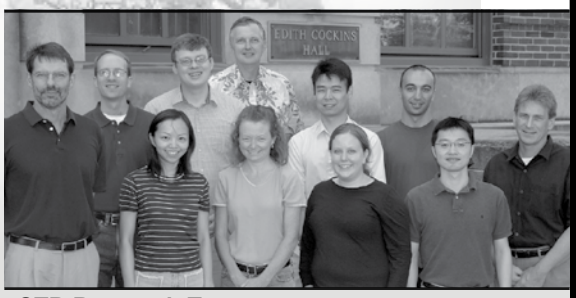

STB Research Team
Front row: Noel Cressie, Crystal Dong, Nancy McMillan, Kate Calder, Jian Zhang, and Bruce Buxton
Back row: Greg Young, Peter Craigmile, Tom Santner, Ke Wang, and Michele Morara
Not pictured: Vincent Agboto, Hongfei Li, Rajib Paul, and Jessica Sanford

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CAUSE PURSUES NEW EDUCATION INITIATIVES!

The Ohio State Statistics Department continues to be heavily involved in the national statistics education reform movement. One facet of these efforts is our work at the nucleus of the Consortium for the Advancement of Undergraduate Statistics Education. CAUSE is a national organization dedicated to creating professional development opportunities, providing resources, and extending outreach to underserved groups of teachers, and to enhancing the field of statistics education research.

In 2001 and 2002, the American Statistical Association funded two meetings at Ohio State that laid the framework for CAUSE around the four pillars of resources, professional development, outreach, and research. The 2006 annual spring meeting of CAUSE activists in Columbus helped plan the key CAUSE programs described below and marked the signing of the organizational charter. Under this charter,

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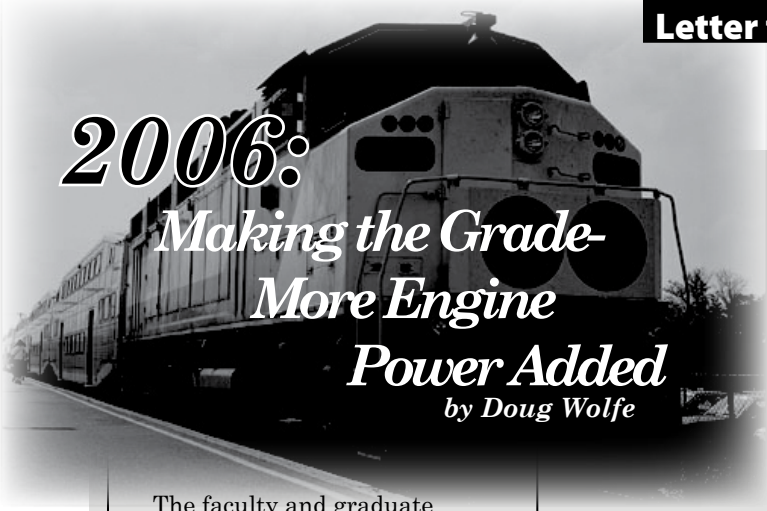

2006: Making the Grade- More Engine Power Added

by Doug Wolfe

The faculty and graduate students in our Department of Statistics simply don't understand the concept of slowing down even long enough for a congratulatory pat on the back or a station break. They continue to make positive things happen faster than Superman's proverbial bullet! Who says academia can't move quickly!! As conductor, the best I can hope for is simply to run as fast as I can to at least stay within sight of the locomotion.

Doug Wolfe

Our external research funding continues to climb as we led the way across the entire College of Mathematical and Physical Sciences in increased funding last year, resulting in yet another all time high in annual grant income for our faculty. These funded projects cover a wide variety of research topics and many federal funding sources, including the National Science Foundation, the National Institutes of Health, the Environmental Protection Agency, the National Aeronautics and Space Administration, the National Security Agency, the US Department of Transportation, and the US Navy. Articles about a selected few of these funded projects can be found elsewhere in the Newsletter.

The Statistical Consulting Service (SCS) had a record year as well, in both internal and external (paying!) projects. Tom Bishop continues to provide excellent leadership as Director of the SCS, not only in terms of operational management of the projects but also in teaching our graduate students about both the professional opportunities available as a statistical consultant and the skills necessary to be successful as one. During this past year we were very fortunate to have hired Chris Holloman as Associate Director of the SCS. Chris is a skilled consultant and brings a lot of energy and expertise to this position. He has already had a major impact on the daily operation of the SCS, especially with respect to attracting external clients.

Not to be outdone, our teaching effort has also remained on the upswing, with burgeoning enrollments at both the undergraduate and graduate levels. The Graduate School has approved our two Graduate Minors, one in Statistics and one in Statistical Data Analysis. These are new options for non-statistics graduate students who wish to obtain some documented expertise in statistical methodology but who do not have the time in their own Masters or Ph.D. programs to complete the entire MAS program. We are active participants in the new Graduate Interdisciplinary Specialization in College and University Teaching, and, of course, the external MAS program continues to flourish. We have also taken additional steps to increase our undergraduate non-GEC teaching effort. An honors version of Statistics 133 has been approved as has a new honors course, Statistics 246H, designed for high school students who score sufficiently well on their AP statistics test that they are not required to take one of our statistics GEC courses. Both honors courses will be offered for the first time this coming academic year. We have also introduced a new undergraduate sequence for the actuarial science students and are part of a new initiative for an interdisciplinary undergraduate minor program in survey sampling, which involves a new undergraduate survey methodology course. Similar initiatives for other interdisciplinary minor programs are under discussion, including possibilities in the biological sciences, forensic sciences, criminal justice, and the science of sports. Our two Statistics Education Specialists, Jackie Miller and Deb Rumsey, are spearheading much of this renewed undergraduate teaching effort.

There is never a dull moment in our Department but we love every minute of the excitement!

Faculty Awards and Honors

As has become the norm, several of our faculty members received national honors and awards this past year. Steve MacEachern and Deb Rumsey were selected as Fellows of the American Statistical Association. One of our newest faculty members, Xinyi Xu, was selected to receive the 2005 Leonard J. Savage Dissertation Award for the best dissertation last year in the general area of Bayesian statistical theory and methods. Michael Browne has been selected by the Department of Psychology to be the Roger E. Kirk Scholar in Residence for the period 2005-2008. Please join me in congratulating Steve, Deb, Xinyi, and Michael on their prestigious awards!

Personnel Changes—Bigger and Better

In what also seems to have become the norm, we went through

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another faculty search this past academic year. I am pleased to let you know that we were once again very successful in this effort. We hired two entry-level Assistant Professors with full-time appointments in our Department, one Associate Professor with a joint appointment between our Department and the Department of Evolution, Ecology, and Organismal Biology (EEOB), and a third entry-level Assistant Professor with a joint appointment between our Department and the Department of Geography. Although two of them will move to Columbus in summer quarter to set up their research programs, all four will formally join the Department in Autumn Quarter 2006. This brings the number of full-time faculty in our Department to twenty-nine (three with joint appointments and one at our Regional Campus at Marion). I am pleased to introduce you briefly to the four newest members of our faculty. (For more details, including their areas of research expertise, see separate articles on each of them elsewhere in this Newsletter.)

Laura Salter Kubatko returns to her alma mater as an Associate Professor with a joint appointment between our Department (80%) and the EEOB Department (20%). She will establish a collaborative research program with interested faculty members in EEOB and they will work to develop interdisciplinary courses with the eventual goal of establishing an interdisciplinary minor in quantitative biology. She will also work actively with the Mathematical Biosciences Institute (MBI) as part of the Provost's Strategic Initiatives to support research strengths across the campus.

As noted, we also hired three new Assistant Professors who will join us in September. The first two, Radu Herbei and Eloise Kaizar, will have full-time appointments in our Department. Radu just received his Ph.D. from Florida State University and Eloise (Elly) just completed her Ph.D. at Carnegie Mellon University. Our third new Assistant Professor, Desheng Liu, received his Ph.D. from the Department of Geography at the University of California, Berkeley. He will have a joint appointment between our Department (25%) and the Department of Geography (75%) and he will work closely with our faculty members in the Spatial Statistics and Environmental Sciences (SSES) Program on areas of common research interests.

There have been a number of other staff changes in the Department this past year as well. Lisa Van Dyke joined us as the Administrative Assistant for Graduate Studies and she helped keep Elizabeth Stasny somewhat sane during this year's annual admissions process! Together they have recruited another excellent group of new graduate students for the coming year. Jean Scott and Ryan Hayes are now part of our growing statistics education presence. Jean helps organize and manage the numerous projects in which Dennis Pearl is involved, including CAUSE and the USCOTS conferences. She has also been assigned the task of making sure that Dennis knows exactly how many minutes he still has before the next deadline!! Ryan provides computer support for many of these statistics education projects as well as general computer support for the Department. Justin Kubatko is also returning to his alma mater to play a major role in our undergraduate teaching effort, including some of our new initiatives in interdisciplinary minors. Finally, Jaime Shutt has joined our staff to help with the day to day operations of the SCS.

Saul Blumenthal, ready to ride off into the sunset after 23 years of service.

As usual, personnel changes are not always additions. Saul Blumenthal chose to retire from the department, effective July 1, 2006. I hope that you will all join with me in thanking Saul for his many contributions to our Department over his 23 years of excellent service here at Ohio State.

Update on Space/Good Space

I am pleased to report that during the upcoming academic year we will be able to see some progress with regard to the space needs of the Department. When the new Mechanical Engineering building is completely operational (likely by spring quarter), we will receive additional space (two current classrooms) in Cockins Hall to help accommodate our faculty, staff, and graduate students. This is very welcome news, of course, but given our recent faculty and staff hiring, it may very well end up being just barely enough to keep our space shortage from worsening. Much remains to be done for the Department to be fully space operational, not only in quantity but most certainly also in quality. It continues to be one of the most serious limiting issues affecting our Department's impact, both within and external to the University. We are looking forward to a long-promised space audit within the College of Mathematical and Physical Sciences that we hope will lead to some long-term resolutions for the space needs of our program.

Clickity Clack, Clickity Clack, Riding on the Numbers Track

As always, all of the credit for the many good things that happened this past year, and those that are continuing to happen, in our Department of Statistics goes directly to the outstanding and dedicated faculty, staff, and graduate students in our program. They are a pleasure to work with and their accomplishments continue to match up with those of the very best statistics departments around the country.

Oops, I hear the whistle call,
The engines rocking Cockins Hall;
Are hard at work, floors one to four,
Our crew is on the move once more;
Clickity, clickity, clickity clack,
The cars are cruising on the track;
I need to run and get on board,
Our very own TBDDITL;
There's zero chance of being bored,
With next year's trip committal;

Clickity, clickity, clickity clack,
Until next year when we'll be back!

Interdisciplinary Research in Industrial Process Engineering

Statistical scientists at The Ohio State University endeavor to obtain innovative solutions to real-world problems in their interdisciplinary research. A broad spectrum of research interests enhances our ability to attack difficult statistical questions that arise in problems in many traditional areas. Would it be productive for statisticians to collaborate with Chemical and Biomolecular Engineers (CBE) to help improve modeling and analysis of chemical processes that sometimes require real time estimation of state of the system? The answers seem to be a definite yes.

Prem Goel and Prof. Bhavik Bakshi, CBE, initiated discussion of possible research opportunities for improved modeling and analysis of chemical processes. The initial efforts led to joint publications based on the research by CBE graduate students, Mohamed Nounou, and Wen-shiang Chen. Bakshi and Goel were thesis co-advisors for Mr. Chen. A wealth of research opportunities also led to a three year NSF grant, entitled "Bayesian Rectification of Nonlinear Dynamic Chemical Process Systems," jointly from the Division of Chemical and Transport Systems and Division of Mathematical Sciences. Hao Hui, Prasenjit Kapat, Lixin Lang and Xiuyun Zhang from Statistics and W-S Chen and Hongshu Chen from CBE have been supported as GRAs on this project, resulting in several joint publications. A brief snapshot of problems that one comes across in this area is given below.

Modern industrial enterprises usually collect a vast amount of data via embedded sensors in real time to monitor processes and to better assist decision making. In a dynamic process, however, extracting useful information from the measured noisy data requires a quick understanding of the unknown system states. These can be estimated based on a model which approximates the exact process. Practical consideration also requires statistical estimation to be able to handle constrained optimization, abrupt changes of model parameters and sometimes unreliable prior information in the context of Bayesian inference. Robust Bayesian estimation is a reliable tool to integrate all available information.

Dynamic process $\{x\}$ and its, possibly noisy measurements $\{y\}$ are often described by a state space model,

$$x_t = f(x_{t-1}, \omega_t), \quad (1)$$

$$y_t = h(x_t, v_t). \quad (2)$$

The state equation (1) depicts the evolution of the unknown process states $\{x_t\}$ over time, and the measurement equation (2) defines the relationship between the observations $\{y_t\}$ and the states $\{x_t\}$, where ω_t and v_t, respectively, denote the process noise and the measurement noise. From the Bayesian point of view, the items of interest are the marginal posterior distributions $p(x_t \mid y_{1:t})$, where $y_{1:t} = (y_1, y_2, \ldots, y_t)$, as well as the prediction of the future states, under the assumed process model.

Considering the generality of state space models, it is nearly impossible to obtain an analytic form of the posterior distribution, except in a few limited cases, e.g., a linear system with Gaussian prior and additive Gaussian noise in both the state and measurement equations. In such a case, the posterior is also Gaussian with its mean and variance given recursively by the Kalman Filter. For non-linear, non-Gaussian models, an approximation to the posterior distribution is all one can hope for.

With increased computing power and advances in statistical theory, simulation-based Bayesian methods have attracted extensive attention. Markov Chain Monte Carlo (MCMC), for example, can obtain samples from the joint posterior distribution, with possible state space augmentation. But unfortunately, they require a full iteration each time when new data are available in a dynamic process over time. Hence, MCMC methods are not suitable for dynamic real-time applications. Alternatively, methods based on an importance function use independent samples and weights to sequentially update the approximation at each time. These algorithms are usually called sequential Monte Carlo (SMC), and the generated samples are sometimes called particles. A generic description of the SMC is illustrated in Figure 1. Because of the strong correlation of particles between steps, particle filtering is desirable only for marginal inference as compared to MCMC methods for joint inference. Some of our ongoing research in this area is focused on a serious weakness of SMC that has been largely neglected in the past. Initial samples from a grossly incompatible prior can lead to serious degeneracy of posterior SMC estimates, in that the impact of data is largely ignored in the sequential Bayesian updating, which can lead to a divergence of SMC approximations from the underlying true posterior estimates. To overcome the problem of incompatible priors, several methods have been developed:

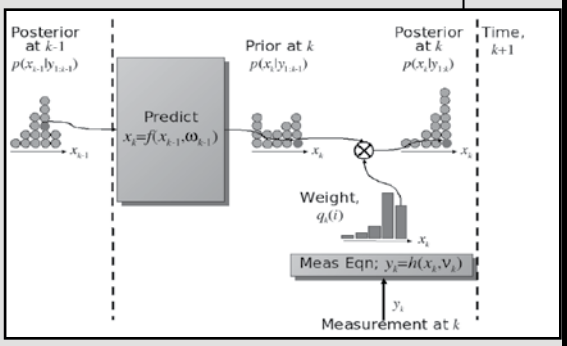

Figure 1: Bayesian dynamic state space modeling via particle filtering

- Empirical Bayes sequential importance sampling/ resampling (EBSIR) uses a uniform distribution defined according to the available initial guess, observation and measurement equation. That is, it reuses the information available in the data at an early stage.
- Hybrid gradient descent/sampling importance resampling (HySIR), on the other hand, uses a weighted combination of observations and priors in a similar way to descent updating.
- A more recently proposed method, Moving Horizon Estimation (MHE) Smoothing, seems to be able to recover even from the worst case of an incompatible prior at the cost of a delay of online estimation. It uses initial samples from a smoothed prior based on measurements in a small window of time.

Further work on these methods is going forward.

Welcome New Faculty Members!

Eloise (Elly) Kaizar

I expect to complete the requirements of the Carnegie Mellon University Department of Statistics Ph.D. program in August, 2006. My statistical interests center on applications in medicine and social science, and their intersection in health services research. As such, I like to work with clinical trial and survey data. My thesis research with my advisor Joel Greenhouse focuses on reducing the bias of estimates by combining information from diverse data sources using a variety of Bayesian models. I am currently applying these ideas to the estimation of the effect antidepressants have on children's suicidal thoughts and actions. I am excited about starting new work and new collaborations here at Ohio State, but I also plan to continue work in the area of my thesis, focusing on the causal nature of estimates derived from these cross-design estimation methods, prior specification in hierarchical modeling, and adapting these methods for survey data.

Elosie (Elly) Kaizar

I have taken a circuitous route to statistics, beginning with a BA in Classic Culture and a BS in Chemistry from the University of Pittsburgh. It only took eight months of work in a paint factory to convince me that I did not, in fact, want to be a chemist. A few more years of work in a health services brokerage led me to statistics. I enjoy this work so much that I am sure I will stick with this career choice!

Since my husband Mike and I are both lifelong Pennsylvanians, the move across the border to Ohio shouldn't be too much of a shock to our systems. We will arrive in August, and I'm looking forward to meeting and working with everyone in my new department.

Laura (Salter) Kubatko

I will be coming to Ohio State from the University of New Mexico, where I have been a faculty member in the Statistics Program for the past seven years. I completed my Ph.D. in Biostatistics here at OSU in 1999 under the direction of Professor Dennis Pearl. My appointment at OSU will be a joint appointment between the Departments of Statistics and Evolution, Ecology, and Organismal Biology.

My primary research is in the area of statistical phylogenetics, which involves estimating the evolutionary history for a collection of organisms given genetic information, often DNA sequences, for these organisms. My recent work in this area involves modeling the relationship between species histories and the evolution of individual genes using the coalescent, and thus bridges the fields of phylogenetics and population genetics.

Laura (Salter) Kubatko

More broadly, I am interested in statistical genetics in general, and I have collaborated on a variety of projects in this area while at UNM. For example, I have worked with asthma researchers to search for genes involved in the murine immune response using microarray and quantitative trait locus data, and with anthropologists to study the effects of candidate genes on susceptibility to tuberculosis infection in native South American populations. I enjoy interdisciplinary work, and hope that my joint appointment at OSU will allow me to build on and strengthen the existing ties between the College of Biological Sciences and the Department of Statistics.

Before beginning my graduate work, I obtained B.A. degrees in Mathematics and Biology from Hiram College, a liberal arts school near Cleveland. My interest in Biostatistics arose from a senior thesis project which used statistical methods to analyze forestry data. I grew up in Steubenville, Ohio, and am looking forward to being closer to my family, most of whom still live there.

I will be moving to Columbus with my husband, Justin, who will be a Lecturer in the Statistics Department, and our two children, Zachary, 4, and Cristian, 2. My hobbies (when I can find time for them) include playing soccer and running.

I know first-hand how great OSU's Department of Statistics is, and I am very excited to become a part of it!

Radu Herbei

It gives me great pleasure to have the opportunity to introduce myself in this newsletter. I am originally from Romania. After receiving my bachelor's degrees in mathematics and economics from the West University of Timisoara, Romania, I moved to the Department of Statistics at Florida State University in the fall of 2001 to continue my graduate studies. I am currently completing the Ph.D. program and looking forward to joining the Statistics Department at Ohio State University this summer.

As a graduate student, my research was in the area of Bayesian and computational statistics and classification problems. In my dissertation, under the supervision of Ian McKeague and Kevin Speer (Department of Oceanography, Florida State University), I developed a Bayesian method to study the inverse problem of estimating water velocities and diffusion coefficients from sparse and noisy tracer concentration observations, in a large region of the South Atlantic Ocean. Inverse problems are statistical problems with application to a variety of fields such as medical imaging, earth sciences, and algorithm development. I intend to continue developing methodology and work on other relevant interdisciplinary problems.

Radu Herbei

I love listening to music, sports and wildlife photography. I liked being a graduate student at Florida State, but I am now ready to move to Columbus and enjoy the change in climate (I miss snow especially). I believe Ohio State is a perfect place for me to continue my academic career and I am looking forward to settling in the new environment.

Graduate Student Profiles

Elizabeth Cusick

When I first stepped foot on Saint Mary's College campus I had plans to graduate with a Marketing degree. While I did graduate with a Bachelors of Business Administration, there were a few twists along the way. After my only required math class, the Mathematics Department got a hold of me and refused to let go. For a brief time they convinced me to pursue a double major but the creative side of my brain craved more attention. When I dropped my math degree to a minor and picked up an art minor as well, my family thought I was crazy.

After graduation in 2002 I worked for two years at the UPN/WB TV station in Columbus, Ohio in their marketing research department. Unfortunately this position didn't satisfy my mathematical side as much as I would have liked. At this point I was seeking a challenge and decided to apply to graduate school.

I started the Masters of Applied Statistics (MAS) program in the summer of 2004 with the early start program. At this point, it had been 3 years since my last math class and I was as nervous as could be. With the support of the faculty as well as my new friends I made it through that first summer, both grinning that I found a challenge, but also with a bit of nervousness of what was yet to come – teaching undergraduate students.

Little did I know I couldn't have been more prepared thanks to the summer TA training course with Jackie Miller. Looking back, being a TA provided me with so many skills I couldn't have learned in a classroom. It helped me solidify the concepts I was just learning myself, and improved the communication skills I would need after graduation.

In the summer of 2005 I took an internship with Procter and Gamble in Cincinnati working in their Swiffer Products Research department. I soon learned more than I ever could have imagined about cleaning! I was able to use many of the statistical concepts I learned to help create technical testing methods on floor cleaning. Who knew there was a formula for dirt and how much is on the floor? They liked my cleaning (and I suppose statistical abilities) so much they offered me a job upon graduation. While I wasn't confident when approaching the MAS exam they were confident for me, mostly because that meant I could start sooner and they believed in me. Thankfully for us all I passed and graduated in March of 2006.

I am now 3 months into my job and loving it. I get to go talk to consumers about what they like/don't like about our product, and then I can take it back to the company so we can make consumers' lives easier and better. I work on projects from the initial planning of experiments and studies all the way through to analyz-

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Cheryl Dingus

As I sat in Commencement at Cleveland State University, I was not satisfied. Sure I had completed my MS in Mathematics. But had I learned everything I wanted to know? Sure I had a good job working at Key Corp. But was that really where I wanted to be? The answer to both questions was clear: No. At that moment I decided I was ready for the poverty of full-time graduate studies. But where should I go?

I remembered my visit to Ohio State for a Statistics Conference when I was an undergraduate at the University of Dayton. I also remembered my Statistics professors saying what a good program Ohio State had. And so Ohio State was my first choice. I visited one August day in 1999. I was so impressed with the diversity of the department and with all the faculty and students that I sent in my application that same day; it was the only application I submitted.

My years at Ohio State were incredible. I developed close friendships during my first year as we spent hours in our first floor office manipulating equations to derive the desired result (there's always a "trick"), stuffing ourselves as we studied for finals (yum…taco dip), running an experiment to determine whether different juice boxes had different amounts of Vitamin C (they do), and coloring Santa Claus light plate covers (I had the most Crayons). Second year our office got smaller as we squeezed four students into Cockins Hall 435; it was a good thing we were close. That year some of us celebrated passing the first qualifying exam, while others did not. The panic at not passing the second qualifying exam overshadowed my third year. But with the patient support of Dr. Joe Verducci, I did pass the next time. I still remember the weeks I spent trying to prove some basic theorem (I could not tell you which one); the successful proof was less valuable than the process.

Life outside of the school was amazing. In August, 2001, I took a long weekend and flew to Las Vegas to get married. Over the years we adopted three miniature dachshunds, who are my babies. Near the end of my graduate education, my brother moved in to pursue his own graduate studies. I was blessed with new friends whom I cherish. I am lucky to have celebrated weddings and babies.

Work was also rewarding. In my second year, I started as a GRA on the MFPG (Multi-Family Psychoeducation Group) project in the Psychology Department under the supervision of Dr. Verducci. Although, this was my first exposure to "real" data, I encountered more real data when I started working as a Research Associate in the Statistical Consulting Service during my fourth year. Real data is nothing like textbook data. And live clients are nothing like textbook

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Michael Schumacher

My collegiate career began at the University of North Dakota after graduating from high school as a member of the 'Class of 2000.' I pursued a degree in Economics at UND while simultaneously stocking up on statistics courses in the math department. During my junior and senior years I discovered an overlap of the two fields and developed a passion for Applied Statistics, particularly statistics applied to business and economic settings.

After considering various quantitative graduate programs at several universities, I decided on seeking a MAS degree at The Ohio State University. OSU was simply the best program for my career goals and their Applied Statistics program was one of a kind. OSU was unique in the sheer volume of course offerings and also the variety of applied courses, such as the consulting courses taught by Dr. Bishop and the statistical programming courses taught by Dr. Fligner and Dr. Craigmile. In addition to the appropriateness of the program, the people were excellent. Dr. Stasny was very helpful and welcoming, and Dr. Wolfe was inspiring and also provided some background on Buckeye football! I began studying in the 'early start' summer session in June of 2004 and the next 18 months flew by.

Courses at OSU were challenging and engaging. An appropriate balance of theory and application kept me honest, as admittedly I was more interested in the application of statistics to the real world as opposed to mathematical derivations! I began to appreciate theory as the means to application and am very grateful to have received a robust training in both. Another benefit of OSU was the size of the graduate student population. From my actual incoming class to 4th year PhD seekers, there were a large number of students who were passionate about statistics and were willing to share their knowledge. Without this web of support I certainly wouldn't have learned statistics to the degree to which I did.

While completing my MAS degree in the Fall of 2005, I began to test the job market. It quickly became apparent that finding a job wouldn't be a problem… the question was could I find a job in my target area, Southern Wisconsin. After sending out my resume to several firms in the area I received a great response. After weeks of interviews I found myself comparing three job offers from three terrific companies! These employers were all complimentary of OSU's statistics program and were happy to have found a graduate level statistician with a passion for business. I currently work for a subsidiary of a Fortune 500 company in Wisconsin. My team's major focuses are testing and analyzing marketing campaigns, performing profitabil-

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Haiyan Xu

I began thinking about applying to graduate programs in the US and Hong Kong in the summer before my fourth year of undergraduate education. Insisting on my staying close to home, my father believed Hong Kong was the best choice for me. However, I was looking forward to experiencing a different country and culture and felt that the United States was a much better place for me to obtain my graduate education.

Although I did my undergraduate study in the Department of International Economics and Trade at Nankai University, I had extensive training in both Applied Math and Statistics during my first two years of undergraduate study. Bearing in mind the gap between statistics and international trade, I believed that doctoral training in Statistics was a very good choice for me because of my interest and strength in statistics, as well as its good career potential.

Searching for a suitable program in the US was difficult as I knew little about these programs. After careful research, I settled on the Statistics program at the Ohio State University. I got in touch with our chairman, Dr. Doug Wolfe, and he enthusiastically encouraged me to apply to the OSU statistics program. In autumn 2000 I sent my application to the department and happily accepted the offer of admission in early 2001.

My first experience of graduate study was the summer program provided by our department. This program is intended to review some of the basic background for graduate study in statistics. In order to attend the summer program, I decided to skip my undergraduate graduation ceremony. I still believe that I made the right decision because this three-month program was very critical to me to make up for my non-math background and to give me a better start. I took the first qualifying exam in autumn 2002. Even now I can still remember how excited I was when receiving the "pass" letter from Dr. Stasny.

In the latter part of my first- year I had started thinking about different areas of research. Reading courses are a great way to learn about the research interests of the faculty, and I began reading with Dr. Jason Hsu who gave me some short papers. At that time I believed that I didn't fully understand those papers. However, this reading course involved a lot of extensive discussion, which led me to a better understanding of statistics. Later on Dr. Hsu became my dissertation advisor.

As part of my TA duties, I did a lot of grading. Grading for Ph.D. level courses was challenging, especially when providing solutions to homework or exams was required, but the reward was amazing. Coming up with good solutions and judging whether students'

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Elizabeth Cusick

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ing the results and presenting them to management. My mom claims I am the Queen of Dirt but I still have more to learn – I think right now I qualify as the Princess of Dirt thanks to the help of Ohio State.

Cheryl Dingus

(continued from page 6)

problems. The experience was invaluable and I cannot count the "minutes" (which were really hours) that I spent with Tom Bishop, the director of the consulting service, talking about projects and consulting. And my work was appreciated, as I shared the Whitney Award for best consultant.

The dissertation experience is an experience like no other. Dissertation research was challenging. I started working with my adviser, Dr. Angela Dean, before I passed the second qualifier. She had great faith in me. While the research was rewarding; the writing was torture. Were it not for the patience and support of Dr. Dean, I would not have made it through. She gave me great advice; though I didn't always listen to it (sometimes I have to learn the hard way). And I believe it truly was to my advantage when I could walk into an interview and say that I was working with her.

Before I finished my dissertation, I started working down the street at Battelle. For three months, I worked four days a week for Battelle and seven days a week for myself. For three months my husband wondered what I looked like. To add to the insanity, we moved during those three months. I don't know what I was thinking.

It's amazing to me to think about where I started and where I am now. Now, with those three magic letters after my name (Ph.D.), there is a whole new world open to me. Dr. Bishop always said the doctoral degree is your union card; I never realized how true that statement is until I got my degree. Sitting here in my office, knowing that I still have so much to learn, I realize that I am where I want to be.

Michael Schumacher

(continued from page 7)

ity analyses, and supporting other channels throughout the business. I benefit greatly from the analytical approach to problem solving I developed while at OSU and I regularly use many of the specific techniques I learned, ranging from standard power calculations to rather complex simulation studies.

Achieving the MAS degree at Ohio State was a rewarding experience and a great career move. I am very thankful to the faculty and other students who helped me along the way and I intend to represent my fellow Buckeyes well!

Haiyan Xu

(continued from page 7)

work was correct required very deep thinking and was indeed excellent training for me. I also worked in the Statistical Consulting Service for a few quarters. Consulting experience taught me how to translate real problems into statistics problems, how to make use of the knowledge learned in class, and how to explain statistics to those who have little statistical background. The experience communicating with people who didn't know much about statistics was beneficial for my classroom teaching later on. I taught recitation sections for Stat 135 for a few quarters and enjoyed teaching a lot. I need to thank my peer TAs for their warmhearted help. Grading midterm and final papers with them, eating pizza, joking, and laughing together are very good memories.

Although getting started in the graduate program was difficult for me, after that everything seemed to go much smoother. I took more courses, spent more than two months to prepare for the second qualifying exam and passed that BIG exam in Autumn 2003, with my dissertation research going on at the same time. Reading more papers, thinking harder, spending more and more time in our freezing computer lab on the 3rd floor typing up my dissertation, I very quickly saw my fourth year at Ohio State coming up and I felt ready to think about my career. In early 2005 I talked to two statisticians from Johnson & Johnson Pharmaceutical Research and Development, L.L.C. (JJPRD) who visited our department to interview graduating students. Later I obtained a job offer from them and became a biostatistician in JJPRD.

I left Columbus in September 2005 for New Jersey, where my job is located. Since then, I have been missing our department a lot. When Dr. Mike Fligner sent an email reminding me of the deadline to turn in this article about my time at OSU, he said that "I'm sure you're missing those summer breaks." But it is much more than that – I am actually missing every single moment at Ohio State.

Dr. Wolfe welcomes students at the New Graduate Student Party.

Congratulations to Our Award Winners!

Departmental Awards

POWERS TEACHING AWARDS

The Thomas and Jean Powers Teaching Awards are presented each year in two categories to (1) the best TAs teaching either recitations or lectures, and (2) an outstanding professor in the Department. These awards were instituted in 1986 through a generous gift to the Statistics Development Fund by Tom and Jean Powers.

The Department is lucky to have a large number of excellent Graduate Teaching Associates. The selection of the best TAs is never an easy task, and there are always a number of extremely good teachers who are runners-up for the award. In 2005-06, the awards for best TA were presented to Lori Hoffman, Joe Kupresanin, and Peter Sprangers. Each of these TAs made an outstanding contribution to the teaching mission of the Department. The faculty award was presented to Professor William Notz.

Winners of the Thomas and Jean Powers Teaching Award; Peter Sprangers, Best TA and Prof. Bill Notz, Outstanding Professor

WHITNEY AWARDS

In 1992, Professor Emeritus Ransom Whitney and his wife Marian Whitney made a generous gift to the Statistics Development Fund to institute several awards for graduate students. In 2005-06, the winner of the best consultant in the Statistical Consulting Service was Katie Droll. The award for the best research associate was shared by Lixin Liang and Jian Zhang. The award for best research leading to the Ph.D. was awarded to Bin Li. We congratulate these students and thank them for their hard work.

CRAIG COOLEY MEMORIAL PRIZE

The Craig Cooley Memorial Prize for 2005-06 was awarded to Cheryl LeSaint. Each year this award is presented to a graduate student in the department demonstrating exceptional scholarly excellence and leadership abilities. Craig embodied these two qualities throughout his graduate career. Tragically, he was killed just before receiving his Ph.D. in 1996. To honor his memory the department created the Craig Cooley Memorial Prize. For additional information about contributing to this fund, please see page 15.

UNIVERSITY AND COLLEGE FELLOWSHIPS

Single year University Fellowships were awarded to Candace Berrett, Fangzhou Hu, Stephanie Jones, Joel Martin, Aaron Quan and Jingyuan Yang. Single year College Fellowships were awarded to Jared Schuetter and Chaoran Ye.

INDUSTRIAL FELLOWSHIPS

Each year the Department of Statistics is able to offer special recruitment Fellowships to some of the very best new applicants to our graduate programs. These Fellowships are funded through the generous support of sponsoring industrial organizations, for which the Department is always grateful. The sponsoring organizations, their Fellowship stipend amounts and the 2005-06 student recipients are as follows:

Lubrizol Foundation Fellowships
Two awards in the amount of $1,500 each and one award in the amount of $3,000 are provided by the Lubrizol Foundation. The 2005-06 recipients were Joseph Kupresanin from University of Akron, Joel Martin from Millersville University and Donald Turchany from Purdue University.

Battelle Fellowship
An award in the amount of $3,000 is provided by Battelle. The 2005-06 recipient was Candace Berrett from Brigham Young University.

Merkle Fellowship
An award in the amount of $3,000 is provided by Merkle. The 2005-06 recipient was Aaron Quan from California Polytechnic State University.

Proctor & Gamble Fellowship
An award in the amount of $3,000 is provided by Proctor & Gamble. The 2005-06 recipient was Jared Schuetter from Bowling Green State University.

Wyeth-Ayerst Fellowship
An award in the amount of $3,000 is provided by Wyeth-Ayerst. The 2005-06 recipient was Stephanie Jones from Rochester Institute of Technology.

We appreciate all the support from the Lubrizol Foundation, Battelle, Merkle, Proctor & Gamble and Wyeth-Ayerst.

CHAIR FELLOWSHIPS

Single year awards in the amount of $1500 are provided through the Department as Chair Fellowships. The 2005-06 recipients were incoming students Jeremiah Butler, Lauren Hoffman, and Michael Sonksen.

Please join us in congratulating the following from among us who were elected this year to positions in ASA:

Tom Santner: Council of Sections Representative on the ASA Board of Directors

Bill Notz: Chair-Elect of the Section on Physical and Engineering Sciences

Deb Rumsey: Executive Committee at Large for the Section on Statistical Education

Congratulations, Tom, Bill, and Deb, and thanks for representing the Department in these new positions.

CAUSE INITIATIVES

(continued from page 1)

day-to-day operations of CAUSE are supervised by the Executive Director (Dennis Pearl, Ohio State University) and four Associate Directors (Research - Joan Garfield, University of Minnesota; Outreach - Deborah Rumsey, Ohio State University; Professional Development - Tom Short, Indiana University of Pennsylvania; and Resources - Roger Woodard, North Carolina State University).

Signers of the CAUSE charter, March, 2006: Julie Legler, Deb Rumsey, Tom Short, Brian Smith, Allan Rossman, Dennis Pearl, Dick Schaeffer, Joan Garfield, Roger Woodard, and Mary Parker.

CAUSEweb digital library
(web: causeweb.org)

In August 2004, www.CAUSEweb.org went live providing an extensive digital library of resources for statistics instructors as part of the National Science Digital Library system funded by NSF. CAUSEweb now contains more than 1500 items in the resources collection, more than 2100 items in the statistics education research literature collection, dozens of items formally reviewed for content quality, effectiveness for teaching, and ease of use, and hundreds of items providing services or miscellaneous enhancements to community members (calendar entries; job opportunities; archival audio, video and presentations from other CAUSE programs; and collections of statistics cartoons, quotes, jokes, and songs for free course use are all examples). CAUSEweb's six thousand unique visitors per month can quickly locate these resources using an advanced search over any of the more than 20 Open Archive Initiative compliant metadata tags. As CAUSEweb moves into its third year, new emphasis is being placed on enriching items in the collection with associated lesson plans and student assessment items.

CAUSE webinars
(Info: Jackie Miller, jbm@stat.ohio-state.edu
web: causeweb.org/webinar)

CAUSE hosts a monthly series of webinars; these are seminars on the web with participants talking together on a conference call while viewing and sharing live presentations. CAUSE webinars are on the second Tuesday of each month from 2 to 2:30 p.m. The webinars are free and registration goes on-line about one month in advance. Those unable to attend these live presentations may still view the archived audio and video.

CAUSE / IASE program in developing countries
(Info: Dennis Pearl, pearl.1@osu.edu)

CAUSE is teaming with private publishers and the International Association for Statistics Education (IASE) to provide statistics textbooks to schools in developing countries. Under the program, publishers donate new texts that are being replaced by a new edition. CAUSE and IASE work to match appropriate texts and schools. The first schools to benefit from this program will be chosen based on the recommendations of the Education Committee of the South African Statistics Association.

CAUSEway Workshops
(web: causeweb.org/workshop)

In 2005, CAUSE was awarded an NSF National Dissemination grant to host a series of workshops aimed at three target audiences:

- Teachers of introductory statistics courses,
- Math education faculty who teach statistical content to pre-service K-12 teachers, and
- Statisticians wishing to refine post-introductory courses.

The CAUSEway workshop series was launched in summer of 2006 with one offering in each of the three tracks. CAUSE has plans for approximately a half dozen workshops each year in 2007 to 2009 in different regions of the country. The workshops have no registration fee or cost for materials, but early registration for these opportunities is encouraged.

USCOTS
(Info: Deb Rumsey, rumsey@stat.ohio-state.edu
web: causeweb.org/uscots)

The capstone event in the CAUSE calendar of activities is the biennial U.S. Conference On Teaching Statistics (USCOTS) at The Ohio State University. The first USCOTS in 2005 was a huge success with approximately 300 participants enjoying stimulating plenary sessions, lively breakout sessions and poster presentations, computer software test drives, technology demos, round table discussions, and "USCOTS Interactive" featuring a variety of exemplar teaching activities built into the conference format.

The second biennial USCOTS will take place May 17 to 19, 2007 at OSU's Blackwell Hotel and Pfahl Conference Center and promises to be even more exciting than the first. The USCOTS program committee, chaired by Deb Rumsey, has set the theme for USCOTS '07 as Taking Statistics Teaching to the Next Level. 'Next level' has many interpretations, such as developing a second course, gaining more confidence in teaching statistics, moving students beyond statistical literacy to statistical thinking, and using the latest technology to improve teaching and learning. USCOTS is a 'working conference' with many opportunities for hands-on activities, demonstrations, networking, sharing ideas, and receiving the latest information on research and best practices in teaching statistics. The outstanding line-up of plenary speakers includes Jessica Utts, Paul Velleman, Dick DeVeaux, Allan Rossman, and Mike Shaughnessy. Special funding from the College of Mathematical and Physical Sciences at Ohio State will provide free registration and other conference costs for OSU faculty and graduate students, while a recently funded NSF grant supports

the conference and the year-round activities of special interest clusters of people with common interests and goals in statistics education.

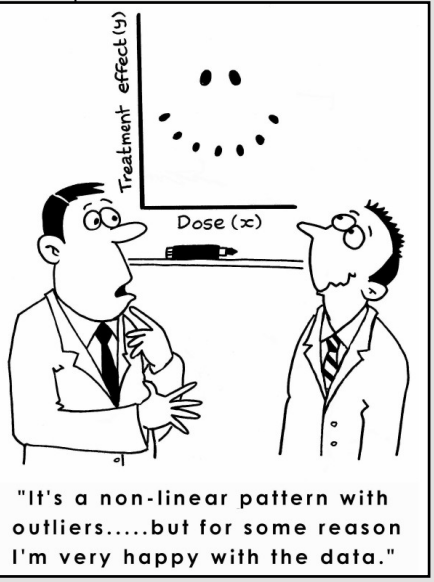
Register early for USCOTS '07 and apply to participate in a cluster group at www.CAUSEweb.org/uscots.

Undergraduate Statistics Project Competition (USPROC) (web: causeweb.org/usproc.php)

This year CAUSE announced its first undergraduate statistics project competition open to teams of up to 3 undergraduate students. The purpose of USPROC is to encourage the development of data analysis skills, to enhance presentation skills, and to recognize outstanding work by undergraduate statistics students. The top three projects will earn monetary awards and a student author and instructor sponsor from each of the winning projects will be invited to present their projects at USCOTS next May. Detailed information on the competition may be found at www.CAUSEweb.org/usproc.php.

With your help, more is coming ...

CAUSE is an active organization that needs activists to move these education initiatives forward and to start new ones. As examples, reviewers are needed to evaluate materials for CAUSEweb; Instructors are needed to share their best teaching tips in an USCOTS poster or demonstration; Ideas are needed for cartoons, jokes, and songs that can make a statistics class more lively; Mentors are needed for student projects for submission to USPROC; Institutional hosts are needed for CAUSEway workshops; and presenters and active participants are needed for webinars. E-mail pearl.1@osu.edu with your ideas on how CAUSE can advance undergraduate education and contact CAUSE program coordinator Jean Scott (jscott@stat.ohio--state.edu) to sign-up for the quarterly E-News to keep up-to-date about CAUSE programs.



Example cartoon from the CAUSEweb digital library.

Statistics and Geography Collaborate for NASA

Professors Kate Calder and Tao Shi are currently studying the relationship between biomass burning (e.g., forest fires) and particular types of air pollution. This interdisciplinary project is a joint effort with Professors Darla Munroe and Ningchuan Xiao from the Department of Geography at OSU, and the team has been awarded a three-year grant from the National Aeronautics and Space Administration (NASA). Statistics Ph.D. student Eric Lam is currently working as a GRA on the project.

Smoke from agricultural fires contributes to brown haze.

Scientists and policy makers have become increasingly concerned about the implications of the consistent brown haze covering Southeast Asia and the Indian Ocean in terms of human health and climate change. The emergence of this haze is due to increased atmospheric concentrations of carbonaceous aerosols, or small airborne particles, over the region. A large portion of these carbonaceous aerosols are generated by anthropogenic activities, including both slash-and-burn agriculture and fossil fuel combustion. This research seeks to develop methodology to determine the relative contribution of these two types of emissions to the total aerosol burden over the region.

The statistical component of the project involves the development of a framework for modeling the spatio-temporal dependence structure of regional carbonaceous aerosol concentration, given atmospheric circulation processes and observed fire occurrence. This modeling framework will be used to synthesize a variety of types of massive data sets including remote sensing imagery from the MISR and MODIS instruments onboard the NASA's Terra and Aqua satellites, output from simulation-based weather and aerosol transport models, and estimates of biomass emission for various vegetation types.

This framework will ultimately be integrated into a web-based system that will allow users to forecast aerosol distributions under various environmental and land-use related policy scenarios.

Graduate Student Corner *By Elizabeth Stasny*

Graduate Students Kelsi Holland, Soma Roy, and Yanxing Zhao attended the JSM 2006

Our Ph.D. Graduates Prepare to Make Their Marks

We are proud to have another excellent group of Statistics and Biostatistics Ph.D. graduates this year. Below are the titles of these graduates' dissertations and the positions they have accepted:

Ph.D. in Biostatistics:

Yifan Huang – "Modelling and Resampling Based Multiple Testing with Applications to Genetics", Research Scientist, Moffitt Cancer Center and Research Institute, University of South Florida.

Xiang Ling – "Adaptive Design in Dose-Response Studies", Senior Biostatistician, Amgen.

Liang Liu – "Reconstructing Posterior Distributions of a Species Phylogeny Using Estimated Gene Tree Distributions", Postdoctoral Fellow, Department of Organismic and Evolutionary Biology, Harvard University.

Haiyan Xu – "Using the Partitioning Principle to Control Generalized Familywise Error Rate", Biostatistician, Johnson & Johnson Pharmaceutical Research and Development, L.L.C.

Ph.D. in Statistics:

Babis Papachristou – "Constructing Confidence Regions for the Locations of Putative Trait Loci Using Data from Affected Sib-Pair Designs", Postdoctoral Fellow, Department of Human Genetics, University of Chicago.

Juan Du – "Judgement Post-Stratification for Designed Experiments", Applications Staff Member, SAS.

Joseph Kosler – "Multiple Comparisons Using Multiple Imputation under a Two-Way Mixed Effects Interaction Model", Statistician, Childhood Depression Research Project, Western Psychiatric Institute and Clinic, University of Pittsburgh Medical Center.

Bin Li – "Statistical Learning and Predictive Modeling in Data Mining", Assistant Professor, Department of Experimental Statistics, Louisiana State University.

Xiaobai Li – "Stochastic Models for MRI Lesion Count Sequences from Patients with Relapsing Remitting Multiple Sclerosis", Senior Consulting Research Statistician, OSU Center for Biostatistics.

Qing Liu – "Optimal Experimental Designs for Hyperparameter Estimation in Hierarchical Linear Models", Postdoctoral Fellow, Department of Marketing Department, OSU.

Sijin Liu – "Computational Development for Psi-Learning", Senior Statistical Modeling Analyst, JP Morgan Chase Retail Marketing.

Changyi Park – "Generalization Error Rates for Margin-Based Classifiers", Postdoctoral Fellow, Department of Statistics, Korea University.

Qingzhao Yu – "Bayesian Synthesis", Assistant Professor, School of Public Health, Louisiana State University.

Student Presentations at the JSM

In August 2005, the Department had an impressive 28 students presenting their research at the Joint Statistics Meetings in Minneapolis, MN. We were not able to beat that number for the Seattle JSM this August. We did, however, tie that number! Yes, OSU again dominated the JSM with 28 students presenting their research. The students and the titles of their talks are given below:

Zhenhuan Cui: "Finding an Approximate Solution Path of Support Vector Machines for Large Datasets"

Jie Ding: "Pedigree Disequilibrium Test for X-Chromosome Markers"

Marian Frazier: "Investigating Communication within a Multitiered Instructional Team"

Gang Han: "Calibration and Prediction for Computer Experiment Output Having Qualitative and Quantitative Input Variables"

Qinying He: "Estimation of Correlation Coefficient in Bivariate Normal Population Based on Concomitants of Order Statistics"

Tena Katsaounis: "Equivalence of Fractional Factorial Designs"

Namhee Kim: "A Bayesian Approach to Radiographic Surveillance in Children"

Jessica Kohlschmidt: "Missing Data and Consequences in Ranked Set Sampling"

Lixin Lang: "An Implementation of Constrained Sequential Monte Carlo by Particle Resizing"

Hongfei Li: "Testing for Spatial Dependence Based on the SAR Model"

Xiaobai Li: "Stochastic Models for MRI Lesion Count Data from Patients with Relapsing Remitting Multiple Sclerosis"

Liang Liu: "Reconstructing Posterior Distributions of a Species Phylogeny Using Estimated Gene Tree Distributions"

Shannon Markiewicz: "Order-Restricted, Randomized Designs for Linear Models Using L1 Norm"

Xueliang Pan: "Reconstructing Evolutionary Trees Using Amino Acid Substitution Models that Allow Rate Variation to Depend on Spatial Location"

Rajib Paul: "Bayesian Change Point Analysis for Local Linear Regression: a New Approach to Prior Selection"

Soma Roy: "Childhood Obesity: What's the Mother's Marital Status Got to do with it?"

Christopher Sroka: "Approximate Confidence Intervals from a Ranked Set Sample"

Yiping Sun: "Two-Sample, Ranked-Sum Test for Order-Restricted Randomized Designs"

Shuyan Wan: "An Importance Sampling Procedure for Obtaining Confidence Intervals of Disease Loci with General Pedigree Data"

Ke Wang: "Order Statistics of Concomitants of Subsets of Order Statistics and Applications"

Lai Wei: "Modeling Distortion Product Otoacoustic Emissions Using Noncentral-F Mixed Effects Models"

David Wheeler: "The Effect of Collinearity on Parameter Estimation in Bayesian Spatially Varying Coefficient Models"

Yonggang Yao: "Spatial Multivariate EOFs: Discrete to Continuous Approximations"

Lili Yu: "The LASSO Method for Variable Selection for Right-Censored Data"

Qingzhao Yu: "Bayesian Synthesis"

Jian Zhang: "Predicting Spatial Exceedance Regions"

Yanxing Zhao: "Parametric Inference from Window-Censored Renewal Processes and Applications"

Jin Zhou: "Composite MicroRNA

Target Predictions and Comparisons of Several Prediction Algorithms"

Award Winning Students

Our students continued their award-winning ways locally and at the national level this year.

Qingzhao Yu was a winner in the 2006 Student Paper Competition for the American Statistical Association's Section on Bayesian Statistical Science with her paper, "Bayesian Synthesis".

Jessica Kohlschmidt was selected by the Survey Research Methods Section of the American Statistical Association to receive a Student Travel Award for travel to the Joint Statistical Meetings.

New graduate student **Kathryn McFarland** was chosen by the OSU Graduate School as the Jules B. LaPidus Distinguished University Fellow. Only one student is chosen each year to win this designation.

First-year student **Yi Liu** won a Summer Research Fellowship through the OSU Center for Survey Research to do original survey research. Yi's research, using the National Longitudinal Surveys of Youth, is on "Adjusting for Missing Covariates Using the EM Algorithm for Logistic Regression Models: A Study of the Effect of Childhood Overweight on the Date of Onset of Menses." Yi began her work as part of an interdisciplinary research group on pathways to obesity including Prof. Pat Reagan of Economics, Prof. Pam Salsberry of Nursing, and Elizabeth Stasny.

Qing Liu and **Soma Roy** were selected as finalists and presented their research in the OSU Edward F. Hayes Research Forum this spring. Soma Roy also won a Ray Travel Award from the OSU Council of Graduate Students to travel to the Joint Statistical Meetings.

At last year's JSM in Minneapolis, **Jesse Frey** (Ph.D. 2005) won the Stat Bowl for the second year in a row! We can repeat exactly what we reported in last year's newsletter. Jesse gave an impressive performance in all rounds of the Stat Bowl – the competition didn't have a chance!

New Student Seminar Series

Thanks to the energy and enthusiasm of fourth-year student Kimberly Walters, the Department's graduate students now have their own seminar series -- by students and for students. According to Kimberly, "The purpose of the monthly student seminar series is to give the graduate students a chance to practice our talks and share information among our peers in a constructive, non-threatening environment."

The following students presented at the Statistics Student Seminar since its inception:

Feb '06

Yonggang Yao: "Stochastic Integral, Splines, and Kriging"

Christopher Sroka: "Approximate Confidence Intervals from a Ranked Set Sample"

April '06

Shannon Markiewicz: "Order Restricted Randomized Design for Linear Models using L1 Norm"

Soma Roy: "The Fragile Families and Child Wellbeing Study: Does it matter that Daddy's not there?"

May '06

Yanxing Zhao: "Parametric Inference from Window Censored Renewal Processes and Applications"

Dianne Bautista: "Survey of Nonparametric Covariance Estimators for Stationary Processes"

Alumni News

Dave Cameron (MAS 1987) resides in Palatine, IL with his wife and two children; Sylvia (age 10) and Ian (age 4). Dave is Director of Statistical Methodology for ACNielsen in Schaumburg, IL. He leads a team of statisticians including two recent graduates from the OSU Statistics programs. Dave's focus is on researching and implementing ways to measure packaged goods manufacturer's sales via a combination of a sample of retail stores combined with a longitudinal panel of households.

Bill Donaldson (MAS 1987) returned to the central Ohio area in November 2003, when he accepted a position within Nationwide. Currently, he works for the Pricing Research Group for Standard Auto. Bill writes that he is glad to be back in the Columbus area because he can occasionally get down to the Statistics Department to attend a seminar.

Kristin (Blenk) Duncan (Ph.D. 2004) recently moved from Chicago to California. She writes, "I am beginning a position as Assistant Professor in the Department of Mathematics and Statistics at San Diego State University. My research interests are in extending my dissertation work on assessing the fit of Bayesian models and item response theory. Other than that, I miss Chicago's public transportation terribly, though I am happy that I no longer have to limit my purchases to what I can carry home!"

Jia (Jessie) Liao (MAS 2003) is working as a pricing actuarial associate at the OneBeacon Insurance Group in Boston. She is also keeping busy taking actuarial exams for the fellowship designation.

Ellen (Mecklenburg) Scheib (MAS 2003) and her husband, Vince Scheib, live in Durham, North Carolina. Ellen recently accepted a job at RTI International working as a Research Statistician in their Statistics and Epidemiology unit.

Matt Snow (MAS 2003) and his wife became the parents of a son, Henry David Snow, born August 3, 2006. Matt was recently promoted to lead the Test Design and Pro Forma analysis group at Chase Retail Marketing.

Iyue Sung (Ph.D. 2001) and his wife Keesa now have 3 girls - Francesca, AnnaClare, and Eleni - ages 6, 4 and 2. Iyue writes, "We are living in Marblehead, Massachusetts (near Boston) and enjoying a very fun and noisy life! I'd love to hear from any alums in or outside of the Boston area (college football season gets lonely out here). Professionally, I'm working for Mercer Management Consulting. My work involves helping our clients quantify and understand who their customers are, how they behave and why, and using this information to guide their company's growth. It's very interesting work and regularly utilizes the excellent training I received in Cockins Hall!"

Jie Qin (MAS 2005) is working as a Statistical Programmer for a clinical research group focusing on Cardiovascular Disease at the Brigham and Women's Hospital in Boston.

Halloween Party

Right: David Kadonsky (pirate) and Peter Sprangers (Care Bear)

Below: Pumpkins on Parade

Graduate Student Corner (continued)

We are delighted to hear from our all our alumni! Please contact Elizabeth Stasny (eas@stat.ohio-state.edu) or Mike Fligner (maf@stat.ohio-state.edu) with your latest personal and/or professional news.

Summer Internships

Again this summer our students were hired for summer internships close to home and on the other side of the world.

Sheenu Cherian stayed close to OSU, working as a Health Research Analyst Intern at Permedion in Westerville, OH.

Li-Fang Yang traveled to Beijing, China to work as a Data Mining Consultant at OgilvyOne Worldwide.

FangZhou Hu went to Boston to be a summer analyst at Mercer Management Consulting.

Lei Kang traveled to Canberra, Australia for her internship in the Division of Mathematical and Information Sciences of the research organization. She is working on a project developing methods for generalized additive models for water quality trend analyses.

Joe Kupresanin is spending the summer at Lubrizol in Cleveland working as a statistics intern.

Cheryl LeSaint is enjoying the summer in Cary, NC as the inaugural winner of the SAS Summer Fellowship in Statistics, co-sponsored by the Statistical Research and Development group and the Educational Practice group. She is working in the statistical software development division of SAS.

Mike Salwan and Joanne Sklodowski get to know each other at the New Graduate Student Party.

Sunghoon Park is working as a Statistics intern at Nationwide here in Columbus.

Aaron Quan is in California working as an assistant researcher at the NASA Jet Propulsion Laboratory.

We're Not Just About Statistics

Lest you worry that this is a Department of Statistics nerds, we wish to assure you that our students have an amazing range of talents in a wide variety of areas. Some examples are below.

John Draper plays trombone in the Ohio State Marching Band (TBDBITL). Next year he will hold a leadership position in the band as squad leader in F Row. This year John was selected to design the band's pre-game and halftime shows for the 2006 OSU Spring Football Game. He conducted the band from the sideline during the show.

Hongfei Li holds a truck-driver's license in China. She got the license at her father's urging, "just in case". Hongfei reports that she was the only girl in her truck driving class and one of the very few students who passed the road test.

Michael Salwan worked as a photographer, taking pictures of sporting events and concerts for the local newspaper and the University of Illinois yearbook while he was an undergraduate.

Brian Schnitker has a degree in the culinary arts and worked as a professional chef for a number of years before returning to school to obtain his undergraduate degree in mathematics.

Chris Sroka was a contestant on the Jeopardy! show that aired December 24, 1996. He was the winner based on the Coryat score, which disregards wagers and forced answers on Daily Doubles.

Liang Liu and **Lili Yu** both hold medical degrees from Tianjin Medical University in China.

Yonggang Yao received a Ph.D. in Physics from Wuhan University in China.

New Dependent Variables

Below are the births, and relevant data, reported by our current students and faculty members in the past year:

Current student **Sunghoon Park** and his wife became the proud parents of a daughter, Abigail, on December 17, 2005.

Nicole Kelbick (Ph.D. 2003) and husband Matt announced the arrival of their son, Ryan Geoffrey Kelbick on March 11, 2006 at 1:03 a.m. He weighed in at 8 pounds, 11 ounces and was 20 inches long.

Wei Wang's son Charlton Li was born on May 24, 2006. He weighed in at 8 pounds, 13 ounces, and was 20.5 inches long. Mom reports that, "He is a big boy and very cute."

Shiling Ruan's twin daughters arrived the morning of July 17, 2006 at 8:00 and 8:01. Their vital statistics: Yaxi Sophie Huang – 5 pounds, 9.5 ounces, 18.5 inches, and Gesi Rachel Huang – 5 pounds, 11 ounces, 19.5 inches. Shiling reports, "We are exhausted now, but double the trouble, double the fun!"

New student **Joe Hutchings**, who will be joining the Department this fall reports, "My wife gave birth to our second son, Caleb Mark Hutchings, on July 5, 2006. He was 8 pounds 5 ounces, 20 3/4" long, has some brown hair, and we're very happy. Our two boys are almost 14 months apart."

Holiday Party
Above: Xinyi Xu, Xiao Lin, Lei Kang, and friend
Right: Deb Rumsey with son Clint

Faculty member **Tao Shi** and his wife Huaxia introduced a new buckeye into the Statistics world at 10:45 a.m. July 24, 2006 when their son, Edwin Tianyue Shi arrived.

Many Thanks to Our Donors

We wish to recognize those alumni and friends who have helped us over the past year. Your donations make it possible to continue to attract, train, and reward our excellent graduate students. Many thanks to the following donors:

Craig Cooley Award Fund
Mary Ellen Smircich Frustac
Marcie Naber

Rustagi Memorial Lectureship Fund
Madhu Anderson
Patrick Anderson
Jagdish and Kamla Rustagi

Statistics Graduate Fellowship Fund
Rebecca E. Trempel
Yuanjie Zhang

Statistics Support Fund
Hal Bogart
Marla Prenger Gross
Randall Potter
Donna Stockrahm
Jerome Stockrahm

Thomas E. and Jean D. Powers Award Fund
Robert Abel
Daniel Cotton IV
Neal Wallingford

Whitney Endowed Fund
Hal Bogart
Walter Hoy

(Not listed above are the members of the faculty and staff who donated to the Department this year, as that would almost require giving a roster of the Department. Those gifts are evidence of the commitment of the faculty and staff to the Department and are also greatly appreciated.)

Noel Cressie Receives OSU Distinguished Scholar Award

Established in 1978, the OSU Distinguished Scholar Award recognizes exceptional scholarly accomplishments by senior professors, as well as the work of younger faculty who have demonstrated great scholarly potential. The honoraria and the award are supported by the Office of Research. Recipients are first nominated by their departments and then chosen by a committee of senior faculty which includes several past recipients of the award. Distinguished Scholars receive a $3,000 honorarium and a research grant of $20,000 to be used over the next three years.

Professor Noel Cressie of Statistics was one of the six Distinguished Scholars selected this year. Dr. Cressie is considered to be an eminent scholar whose contributions to the burgeoning fields of spatial statistics and environometrics have been many, noteworthy and significant. Noel joined the Statistics Department in 1998 to found and head the Program in Spatial Statistics and Environmental Sciences. Excelling in research, teaching, service and communication, he has authored or coauthored roughly 200 refereed publications, 60 non-refereed proceedings and other publications, and 100 other contributions. His research has been funded by agencies such as the National Science Foundation, the American Chemical Council and the Office of Naval Research. Cressie's textbook, Statistics of Spatial Data, is the most comprehensive and widely cited in his field. The primary application of his study has been to the disciplines of global remote sensing, regional climate modeling and analysis of multivariate, spatio-temporal data sets. Additionally, he has been recognized with several honors, including the Distinguished Achievement Medal of the American Statistical Association, Statistics and the Environment, and he has been instrumental in the training of the next generation of statisticians and applied scientists. Cressie received his Ph.D. in statistics from Princeton University.

OSU President Dr. Karen Holbrook presents Dr. Cressie with the Distinguished Scholar Award.

MODELING OF EXPOSURE PATHWAYS

(continued from page 1)

individual-specific data drive the Local Environment to Personal Exposure to Biomarkers stages of the STB model.

Despite the wealth of information on individual-specific exposure routes provided by NHEXAS, a major difficulty in making population-level inferences is that the NHEXAS sampling design provides limited geographic coverage. NHEXAS data alone cannot be used to make inferences on exposure routes for the general population since there is substantial spatial variation in both the naturally occurring and anthropogenic levels of metals in the Global Environment. To generalize the information provided by the NHEXAS data, a variety of different types of additional data (e.g., emission inventories, dietary patterns, and levels of metals in ambient air, source and treated water, soil, stream sediment) can be incorporated into the model for individual exposure pathways. Data of this sort are used in the Sources and Global Environment stages of the hierarchy. Extending the pathways framework from individual-specific Local Environment back to the Global Environment requires modeling data collected at misaligned spatial scales and according to different protocols. As an example of one of the Global Environment components of the STB model, stream-sediment data associated with watersheds are used to characterize the levels of metals in soil across counties.

In addition to providing a better understanding of pathways of exposure to toxic metals, a long-term objective of the STB project is to explore the link between exposure to toxics and human-health outcomes. Since the biological effects of toxic exposure are not well understood, the aim is to characterize the variation in individuals' exposures within a population, which in turn can be related to health patterns in the population. Finally, the pathways modeling approach is amenable to assessing the potential impacts of environmental policy. Given different emission reduction or environmental remediation scenarios, predictions of the reduction of individual-specific exposure can be obtained, along with corresponding uncertainty statements. Quantifying the impact of different scenarios on the outcome of interest (i.e., personal exposure) is of great value when performing cost-benefit analyses of changes in environmental policy. (Info: stat.ohio-state.edu/~sses/research_stb.html)

Supporting Current and Future Students

As you can tell from the previous pages, we have a spectacular group of graduate students in the Department. To continue to attract and support these students is, of course, expensive. For example, the Department matches any travel support that students receive, up to the actual cost of travel. We recognize excellence in teaching, research, consulting, and service by graduate students through annual awards. We pay for outstanding potential students to come visit the Department. We ask you to consider helping to support our current and future students through a contribution to one of the Departmental funds for graduate students:

Graduate Fellow Fund #06940-310567
Statistics Support Fund #06940-307669
Craig Cooley Fund #06940-601434
Powers Award Fund #06940-605898
Whitney Scholarship Fund #06940-607689
Rustagi Memorial Lecture Fund #06940-606245

This is an excellent way for alumni to give something back to the Department. And remember, the better the Department becomes, the more valuable your own degree is!

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CONGRATULATIONS

To the following students earning degrees in 2005-06!

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- Yanqing Li
- Chuanyi Lin
- Chun-Hao Tseng
- Yunfei Wang

AUTUMN 2005
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- Hyun Ji Park
- Jie Qin
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- Lynne Marie Tower
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- Xiaoxia Wu

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- Soma Roy
- Adam Nicholas Weimer

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- Jie Ding
- Katie Rose Droll
- Victor Manuel Guerrero-Aguilar
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- Lei Kang
- Ju Hee Lee
- Scott Gerard Mollan
- Hyejung Moon
- Christopher James Sroka
- Yea-Kang Yoon

Doctorate

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SPRING 2006
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- Sijin Liu