



# STAT

# NEWS

September 2007 Volume 12

## Message from the Department Head



Time is flying by here at Dear Old State. Sometimes it seems that the only thing that stays the same are the ancient photos of the faculty in the hallway outside the main office. (See photo to the left.) I hope you will take a few minutes to peruse this issue of STAT NEWS, and catch up with what's happening here.

Here are some of the highlights from my point of view. The biggest excitement during the fall season is the influx of new faces that gives the place a feeling of constant rebirth. You will see that we have three new faculty this fall, as well as two departures. We also had many visiting faculty come through during the last year, both as colloquium speakers and as short term visitors, and we expect many more this year.

This Fall semester we admitted 17 new students into the M.S./Ph.D program, and 8 more into the M.A.S. program. In the newsletter, you will see that we made room for these students by graduating an astonishing 12 Ph.D. students over the last academic year, as well as 14 M.A.S. students. One of the major demographic shifts over the last few years has been the dying out of the M.S. as a terminal degree program at the same time that the Ph.D. and M.A.S. programs have flourished.

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We also had 12 students graduate with a Bachelor's degree in Statistics during the year, continuing a modest growth of this program. We are currently investigating the addition of a track for actuarial students, something that could significantly expand the size of our program.

In addition to maintaining the beehive of activity that is our educational program, our faculty has been busy keeping the Department up to snuff in its leadership role in statistical research. Inside this issue you will learn information about recent major achievements, meetings, and honors won by the faculty.

We also have news on a more personal note. Inside you can read about our latest Alumni Workshop, a very brief (but hopefully growing) section on alumni news, and a few personal items concerning the local crew members.

I would like to conclude by thanking the many people who have contributed to the department over the past year. Your names can be found on the last page. You have made a difference in the productivity and happiness around the department, I assure you. And if you are not yet a contributor, please consider us in the future!

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## From the Director of Outreach in the Department of Statistics

The Penn State Department of Statistics initiated a professional **Master of Applied Statistics (MAS)** in Fall 2001, with 10 students beginning the first year, and an average of 15 students per year since then. To date about 60 students have graduated from the program. When the program was approved by the Graduate Council, it was approved for delivery through traditional classroom resident instruction, and also for eventually offering this through the World Campus via on-line Internet-based mode of instruction. The intent from the outset was to create a program which would be available to scientists in the workforce who wish to add to their set of skills in the area of statistical methods for the design and analysis of experiments.

In the Fall of 2006 we initiated a new **Graduate Certificate in Applied Statistics** which is taught entirely on-line through the Penn State World Campus. The Certificate program is also aimed at professionals working in industry, government, and education, typically someone with a Bachelor's degree or a graduate degree in another area of science, who wishes to improve their statistical analytic skills. The certificate program requires four courses (12 credits) and students who successfully complete the program will receive the Graduate Certificate in Applied Statistics. The credits earned through this on-line program can be applied toward the Master of Applied Statistics degree for students who subsequently are admitted into the resident program. Additional information may be found at <http://www.worldcampus.psu.edu/> under Certificates. To date more than 75 students have enrolled in the certificate program, and although it is too early to know how many will finish the program, there is potentially a sustained demand for the program given the workforce needs in Pennsylvania and elsewhere for this training.

The courses offered under the professional MAS program and the on-line Certificate program are primarily from the Stat 500, 501, ..., 510 sequence of applied courses, offered in residence at University Park. Efforts are underway to transform more of these courses for on-line delivery, with the goal of making the entire MAS program available to on-line education students.

Details about the MAS and other programs are available at <http://www.stat.psu.edu/grad/> and we are always interested in hearing from graduates of this new program and our Ph.D. students as they advance in their careers. I expect there may be teaching opportunities for adjunct faculty with work experience in applied statistics, to teach in the on-line program, as more courses come on-line. If anyone has questions about our on-line programs or would like more information about teaching opportunities at the graduate or undergraduate level, please contact Professor James L. Rosenberger, Director of Outreach in the Department of Statistics.

- James L. Rosenberger (Phone: 814 865-1340; email: [jlr@stat.psu.edu](mailto:jlr@stat.psu.edu))

## FACULTY NEWS

### New Faculty



**Zhibiao Zhao** received his B.S. in Statistics from the University of Science and Technology of China in 2002 and his Ph.D. in Statistics from the University of Chicago in 2007.

Dr. Zhao has joined the Department of Statistics as a tenure-track Assistant Professor. Dr. Zhao's main research interests lie in statistical inferences for dependent data (for example, time series), robust estimation, and asymptotic theories for stochastic processes.

Many existing statistical methods have been developed for independent data and may not be applicable when dependence is present. Dr. Zhao has been developing parametric and nonparametric techniques for linear and nonlinear time series that may exhibit short-range or long-range dependence. Applications of his research include drift and volatility functions estimation in

stochastic diffusion models, model validations for financial time series, and modeling global warming temperature data among others.

Dr. Zhao is also working on robust methods. Many financial datasets exhibit heavy tails, and the classical Least-Square type methods may not be applicable. For such heavy-tailed data, Least-Absolute-Deviation and quantile regression type methods are good alternatives.



**Debashis Ghosh** received a B.A. in Mathematics, Statistics, Economics and French Studies from Rice University where he graduated *summa cum laude* in 1995. He received his M.S. in Biostatistics from the University of Washington in 1997 and a Ph.D. in Biostatistics from the University of Washington in 2000.

Before joining the Department of Statistics at Penn State as a tenured faculty member, Debashis was an Associate Professor in the Department of Biostatistics at the University of Michigan.

Dr. Ghosh's research interests are primarily in statistical methods for the analysis of large-scale genetic and genomic datasets in biological experiments. Many of his substantive collaborations have been with biologists generating high-dimensional datasets using modern high-throughput molecular assays. This forces biologists to deal with making sense of these high-dimensional genomic datasets. He has experience dealing with the various steps of analysis that are needed in the analysis of functional genomic data. These include the following: preprocessing, normalization, differential expression, clustering and classification. He is particularly interested in methods for integrating data across diverse genomic platforms as well as incorporating biological knowledge in the statistical analysis of high-throughput biological data in human disease settings.

Consideration of these high-dimensional datasets has also led to Dr. Ghosh's interest in more methodological problems, most recently involving multiple testing procedures. He has been involved with the development of Empirical Bayes multiple testing procedures for high-dimensional data. This has led to a methodology he terms shrunken p-values for assessment of differential expression (SPADE). He is currently working on a unified testing and estimation framework for such problems. Dr. Ghosh has general research interests in semiparametric models and survival analysis.



**Linda Strauss** received a B.A. in Psychology from Clark University where she graduated *cum laude* in 1989. She received an M.Ed. in Counselor Education in 1991 and a Ph.D. in Higher Education from Penn State in 2001.

Dr. Strauss focuses on the application of statistics, particularly in the social sciences and education. She has worked for almost 20 years as a scholar and administrator at Penn State.

Dr. Strauss's career experiences have spanned many areas of higher education. She collaborated on a national assessment of engineering education for ABET (Accrediting Board for Engineering and Engineering Technology). She consults institutions on accreditation and assessment activities. Dr. Strauss also studies budgeting and finance mechanisms in higher education, student-athletes in higher education, and the identity development of students of color.

Immediately prior to joining the Department in the Statistical Consulting Center as Research Associate and Assistant Professor, Dr. Strauss was an Affiliate Assistant Professor in Higher Education at Penn State.

## Departures

**kb Boomer** resigned her position as Director

of the Statistical Consulting Center effective June 2007. Dr. Boomer accepted a faculty position in the Statistics Department at Bucknell University. Dr. **Durland Shumway**, Research Associate and Assistant Professor, will be the Acting Director of the Statistical Consulting Center. Dr. Shumway joined the Department in 2005.

**THANK YOU kb, Bob and Eli**  
for many years of service to the Department.  
We wish each of you the very very best in your future endeavors

**Robert Heckard** has retired effective October 2007 after 36 years of service.

**Eli Walters** resigned his position as Instructor of Statistics in June 2007 to take a position at Minitab Inc. in State College.

## Faculty Highlights

**Bing Li**, Professor of Statistics, was named Fellow of the Institute of Mathematical Statistics (IMS). The induction ceremony took place July 30, 2007 at the IMS Annual Meeting in Salt Lake City, Utah, USA. Professor Li received the award “for his contributions to sufficient dimension reduction, and semiparametric optimal estimating equations and inference methods, and for conscientious editorial service.”

**William L. Harkness**, Professor Emeritus, received the 2007 Carver Medal from the Institute of Mathematical Statistics (IMS). The presentation of the medal took place July 30, 2007 at the IMS Annual Meeting in Salt Lake City, Utah, USA. Professor Harkness received the award “for his years of distinguished service as Program Secretary and on various committees of the IMS.”

**C. R. Rao**, Emeritus Holder of the Eberly Family Chair in Statistics, has received his 30th and 31st honorary degrees. He received the thirtieth honorary doctoral degree from the Universidade Nova de Lisboa in Portugal and his thirty-first degree at the 121st Commencement of the University of Rhode Island in January 2007.

**Dennis Lin**, University Distinguished Professor of Statistics and Supply Chain Management, has recently been awarded two Patents, entitled, respectively "Single-pass low-storage arbitrary probabilistic locations estimation for massive datasets" (with John C. Liechty and James P. McDermott), and "Efficient and Portable Random Number Generator" (with LY Deng at University of Memphis). The former patent is now certified by US Patent (#7,076,487), while the later has been filed as a provisional patent by the Penn State Patent office and is in the process for US Patent. [Continued on page 8]

## Sabbaticals

**David Hunter** is spending his Fall 2007 and Spring 2008 sabbatical working on a recently emerging topic in statistics called semiparametric mixture modeling at the Universite de Marne-la-Vallee near Paris and the Universite d'Orleans. The international collaborative effort will expand on the NSF-sponsored research that Dr. Hunter has been conducting with Drs. Thomas P. Hettmansperger and Hoben Thomas at Penn State. Dr. Hunter also plans to finish work on a textbook for Springer on statistical large-sample theory, an outgrowth of a graduate-level course that he designed in 2000 at Penn State.

**Jia Li** plans to spend her sabbatical leave during Fall 2007 and Spring 2008 working at Google, Incorporated, Pittsburgh, Pennsylvania. The purpose of her leave is to advance the technologies of statistical learning and data mining by collaborating with leading researchers in the fields and by tackling challenges arising from real-world applications.

**Arkady Tempelman** is on a sabbatical leave during Fall Semester 2007 at Ben-Gurion University of the Negev and Moscow State University. He will be conducting collaborative research on the dimension of random fractal sets, studying ergodic properties of random fields, and proof of new Ergodic Theorems for group actions and representations

## Selected Faculty Activities

### Summer School in Statistics for Astronomers III (June 2007)

The third annual Summer School in Statistics for Astronomers and Physicists was held at Penn State. This 6-day course in fundamental statistical inference was designed to provide physical scientists, and graduate students, with a strong conceptual foundation in modern statistics and to develop a repertoire of well-established techniques applicable to observational astronomy and physics. Classroom instruction was interspersed with hands-on analysis of astronomical data using the public-domain R software package. The team of instructors included Professors *Steven Arnold, G. J. Babu, Eric Feigelson, John Fricks, Murali Haran, Thomas Hettmansperger, David Hunter, Donald Richards* and *C. R. Rao*. Statistical techniques covered included

exploratory data analysis, hypothesis testing and parameter estimation, regression and confidence interval estimation, model selection and goodness-of-fit, maximum likelihood methods and Bayes' Theorem, non-parametric methods, Monte Carlo methods, Poisson processes and time series. **\*\*The 'Summer School in Statistics for Astronomers III' won the Mid-Atlantic Region's University Continuing Education Association (UCEA) award for exemplary non-credit program development\*\***

### **C. R. Rao Advanced Institute for Mathematics, Statistics and Computer Science**

#### **C. R. Rao Advanced Institute for Mathematics, Statistics and Computer Science**

The foundation stone for the **C.R.Rao Advanced Institute for Mathematics, Statistics and Computer Science** was laid by Dr. C. Rangarajan, Economics Advisor to the Prime Minister of India on February 20, 2007 in the campus of the University of Hyderabad.

The Institute was established on a suggestion made by C.R.Rao, Eberly Professor Emeritus of Statistics, for promoting basic research in mathematical sciences leading to technological innovations and acceleration of economic prosperity.

The mission of the institute is to disseminate advances made in mathematical sciences by conducting workshops, international and national conferences and short courses on newly emerging areas of science and technology, guiding Ph.D. students and providing consultancy services to research workers in other disciplines, and to government and industrial organizations. The institute will endeavor to work in cutting edge areas of mathematics, statistics and computer science and provide a forum for national and international experts in different areas to meet and discuss problems of mutual interest.

On the occasion of the foundation stone-laying ceremony, messages of goodwill and congratulations were received from the President of India, the President of USA, the Prime Minister of India, and the President of the International Indian Statistical Association.

The Governing Council of the Institute is seeking qualified persons to work in the Institute on a permanent basis or short terms during sabbaticals. Those interested are requested to contact the Director of the Institute, Professor S.B.Rao by e mail: [raosb@isical.ac.in](mailto:raosb@isical.ac.in).

#### **Message to Professor Rao from President George W. Bush:**

*"I send greetings to those celebrating the construction of the C.R. Rao Advanced Institute for Mathematics, Statistics, and Computer Science. Congratulations, Dr. Rao, on this well-deserved recognition. The United States and India are separated by half the globe, but our two great democracies are closer than ever before. United by opportunities that can lift the lives of our people, our countries are pursuing an historic agenda for cooperation that will strengthen our relationship. Together, we can improve the quality of life for all our citizens and expand the circle of prosperity and development around the world. The vision of the C.R. Rao Institute is to promote education and research and to foster international scientific collaboration. Those who have made this institution possible and those who will serve within its walls are helping to advance knowledge and enhance the lives of people everywhere. I appreciate Dr. Rao, University of Hyderabad, and all those who use their abilities in the spirit of discovery and international goodwill. Your commitment to excellence in education and innovation sets a fine example and inspires others to seize the unprecedented opportunities before us. Laura and I send our best wishes. May God bless you."*

### **The IIA Penn State Astrostatistics School**



*Jogesh Babu, Director of the Center for Astrostatistics*

(July 2-7, 2007) The Indian Institute of Astrophysics (IIA) and the Center for Astrostatistics jointly organized a 6-day school in statistical inference for practicing astrophysicists and physicists affiliated with Indian institutions. The school is based on the curriculum developed for the Summer Schools in Statistics for Astronomers at the Center for Astrostatistics. The school was held on the picturesque campus of the Vainu Bappu Observatory, a field station of the IIA, located near the village of Kavalur in the Javadi Hills, about 175 km south-east of Bangalore.

## **News from the Center for Statistical Ecology and Environmental Statistics**

By G. P. Patil, Distinguished Professor of Mathematical Statistics Emeritus and Director of the Center

### **Environmental and Ecological Statistics Monograph Series Launched**

The Springer Publishing Corporation has launched a special monograph series for environmental and ecological statistics with Professor G.P. Patil as the Series Editor. Several monographs are in preparation. The first two inaugurals are now out. Volume 1 is on Landscape Pattern Analysis for Assessing Ecosystem Condition, co-authored by **Professor Patil** with his student **Dr. Glen D. Johnson**, who did his MS in Environmental Statistics and Ph.D. in Statistical Ecology at Penn State in the recent past. Dr. Johnson is now at the New York State Department of Health. Volume 2 is on Pattern-Based Compression of Multi-Band Image Data for Landscape Analysis, co-authored by Professor Patil with his cross-disciplinary colleague Professor Wayne L. Myers, who is Professor of Forest Biometrics, and Director, Office of Remote Sensing and Spatial Information Resources at Penn State. Both volumes deal with novel integration of statistical geoinformatics, landscape ecology, multi-scale analysis, remote sensing, and geographic information systems.

### **Journal Pays Tribute to Penn State Cross-Disciplinary Classroom in Statistical Ecology and Environmental Statistics**

Leading international journal, *Environmental and Ecological Statistics*, has dedicated a special institutional thematic issue of the journal to the unique Penn State Cross-Disciplinary Classroom in Statistical Ecology and Environmental Statistics that Professor Patil conducted for *Ecometrics* and *Environmetrics* at Penn State until his recent retirement. The special issue carries insightful articles on the synergistically integrative cross-disciplinary within-class learning experiences leading to creative research papers authored and co-authored by involved graduate students, faculty, and visiting faculty affiliated with a variety of different disciplines. The students include B. Ghosh-Dastidar, G.D. Johnson, S. Fei, J.T. Newlin, T.C. Yang, K.S. Bhat, N. Kong, M. Lisy, P. Patankar, K. Hychka, B. Black, and others. The faculty includes W.L. Myers, R. Modarres, K. Kurihara, R.P. Brooks, S.L. Rathbun, G.P. Patil, and others. The issue is available for perusal at the Department's Center for Statistical Ecology and Environmental Statistics.

### **International and National Travels of Professor Patil**

Professor Patil was invited to deliver the Technical Inaugural at the Plenary Session of the Platinum Jubilee Celebration of the Agricultural Statistics Research Institute of the Indian Council of Agricultural Research, New Delhi, India.

He conducted international workshops and seminar at the Map of Italian Nature, Parma, Italy; at ISPRA Meeting of the Partial Order Theory Group of the European Union; at the Watershed Surveillance and Research Institute, Jalgaon, India; at the United Nations University Institute for Software Engineering, McCau, China; and at the Bogor Agricultural University, Indonesia.

He was organizer and chair of a special invited session at the Joint Statistical Meetings held in Salt Lake City. The theme of the session: Multicriteria Prioritization and Ranking with Partial Order Without Compositing Multiple Indicators into an Index in Social, Environmental, and Infrastructure Work

He was invited to serve on the Panel for Building a Sustainable International Digital Government Research Community at the Annual Conference for Digital Government Research of the Digital Government Society of North America.

### **Student Interns and Research Students**

The statistics graduate students involved have been **Songlin Fei**, **Sham Bhat**, and **Yuemei Wang**. The graduate interns have been Jessica Newlin of Civil and Environmental Engineering, Ranjit Srivatsava of Computer Science and Engineering, and Tse-Chuan Yang of Rural Sociology.



## Current Research Grants (active in June 2007)

<i>PI</i>	<i>SPONSOR</i>	<i>TITLE</i>
Akritas, Michael	National Science Foundation	Nonparametric Models and Methods for Social Sciences Data
Babu, Gutti J.	California Inst. of Technology	ITR: Grid Service Workflow for Understanding Massive Data Sets
	National Science Foundation	Astrostatistics: Advancing Statistical Methodology for Astronomy
Hettmansperger, Thomas	National Science Foundation	Nonparametric Mixture Models
Hunter, David	Univ of Washington (NIH Prime)	Modeling HIV and STD in Drug User and Sexual Networks
Li, Bing	National Science Foundation	Collaborative Research: Model-Based and Model-Free Dimension Reduction with Applications to Bioinformatics
Li, Runze	National Science Foundation	CAREER: Model Selection for Semiparametric Regression Models in High Dimensional
	National Science Foundation	CAMLET: A Combined Ab-initio Manifold Learning Toolbox for Nanostructure Simulation
	National Institutes of Health	Center for Prevention and Treatment Methodology: Semi-varying coefficient models for intensive longitudinal data
Lindsay, Bruce	National Science Foundation	High Dimensional Mixture Models
Patil, G. P.	National Science Foundation	Project Geoinformatic Surveillance: Hotspot Detection and Prioritization Across Geographic Regions and Networks for Digital Government in the 21st Century
Richards, Donald	National Science Foundation	Multivariate Statistical Analysis and Image Classification with Applications
Rosenberger, James	National Science Foundation	Adaptive Sampling Designs in Network and Spatial Settings
Shumway, Durland	AMCA 301 Standard	American Movement and Control Association International
Rosenberger, J. L.	PA Fish and Boat Commission	Creel Survey Susquehanna River and Lower Juniata River
Schafer, Joseph L.	National Institutes of Health	Center for Prevention and Treatment Methodology: Improved method for missing data, causal analysis in drug abuse prevention and treatment
	National Institutes of Health	Center for Prevention and Treatment Methodology: Software development and computing support core
Slavkovic, Aleksandra	National Science Foundation	Statistical Disclosure Limitation Methods for Tabular Data

## Visitors

**Bruce Elmegreen**, a research scientist at IBM's T. J. Watson Research Center was at Penn State during May 2007. Dr. Elmegreen's research interests include galactic structure, interstellar matter and star formation. He delivered a lecture on star formation research and collaborated with CAST and the visitor Dr. *Tanuka Chattopadhyay*.

**Brandon Kelly** is a finishing graduate student at the University of Arizona, Department of Astronomy and Steward Observatory. His interests include Astrostatistics, QSOs. He gave guest lectures on statistical treatments of measurement errors in astronomy at the 3rd Summer School in Statistics for

Astronomers in June this year. He also participated in CAST research and gave a seminar in the Department of Astronomy / Astrophysics.

**Tanuka Chattopadhyay**, from Shibpur D. B. College in India, visited the Department of Statistics and Dr. *Jogesh Babu* during May 2007. She came to Penn State to work on improving the statistical methodology linking data with astrophysical models concerning AGN unification and globular cluster evolution.

**Yanxia Zhang**, National Astronomical Observatory, Chinese Academy of Sciences, in Beijing, China, visited the Department of Statistics and Dr. *Jogesh Babu*, during June 3-10, 2007. She also participated in the summer school. She worked with Babu to prepare for the analysis of the forthcoming data from The Large Sky Area Multi-Object Fiber Spectroscopic Telescope (LAMOST), now under construction for first-light in 2008-09. It is a major national scientific project undertaken by the Chinese Academy of Science.

**Antoine Llebaria**, from Laboratoire d'Astrophysique de Marseille (Les

Olives), France, visited the Department of Statistics and Dr. **Jogesh Babu** during June 11-23, 2007, to collaborate with Babu on automatic source detection in crowded Galactic fields observed with NASA's GALEX ultraviolet survey mission.

**Tomoya Yamada**, from the Department of Economics at Sapporo Gakuin University in Japan, will visit the Department of Statistics and

Dr. **Donald Richards** during the period April 1, 2007 through March 31, 2008. Dr. Yamada received his Ph.D. in 1999 from the Institute of Statistical Mathematics in Tokyo, Japan. Drs. Yamada and Richards will be working on inference and distribution theory in the multivariate analysis of monotone incomplete data.

The Center for Statistical Ecology and Environmental Statistics (CSEES) has hosted several international and national visitors involved with digital governance and hotspot geoinformatics within their countries and regions. This has helped invigorate still further the research and training mini-seminars of the Center. The international visitors included Dr. Rainer Bruggemann, Freshwater Institute of Germany and a Poset Prioritization Leader of European Union; Drs. Gauri Rane and Uday Sahu, Biodiversity and GIS Working Group Leaders of the Watershed Surveillance and Research Institute, Jalgaon, India; Dr. Koji Kurihara, Vice-Dean of the Faculty of Mathematical and Environmental Sciences, Okayama, Japan; and Dr. Harry Cullings of the Radiation Effects Research Foundation, Hiroshima, Japan. The national visitors included: Dr. Noshir Contractor, Supercomputer Center, University of Illinois; Dr. Geoffrey Jacquez, President, BioMedware, Ann Arbor, Michigan; Dr. Andrew Lawson, Epidemiology and Biostatistics at the University of South Carolina; Dr. Sharad Joshi, Dept. of Computer Science at the Slippery Rock University; and Larry Brandt of the National Science Foundation.

CSEES also had visiting international graduate interns K. B. Mahajan from Watershed Surveillance and Research Institute, Jalgaon, India, Fumio Ishioka from Faculty of Mathematical and Environmental Sciences, Okayama, Japan, and Angelo Pecci of the Map of Italian Nature, Parma.

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#### [Continued from Page 4] Faculty Highlights: Dennis Lin

##### **US Patent #7,076,487 "Single-pass low-storage arbitrary probabilistic locations estimation for massive datasets"**

By John C. Liechty, Dennis K. J. Lin and James P. McDermott

The present invention includes a single-pass, low-storage, sequential method for estimating an arbitrary quantile of an unknown distribution.

The proposed method performs very well when compared to existing methods for estimating the median as well as arbitrary quantiles for a wide range of densities. In addition to explaining the method and presenting the results of the simulation study, we discuss intuition behind the method and demonstrate empirically, for certain densities, that the proposed estimator converges to the sample quantile.

##### **PSU Invention Disclosure Number 2006-3207 Efficient and Portable Random Number Generator**

By LY Deng and Dennis KJ Lin

The disclosed invention (referred to as DX generators) is a novel method of random number generation which improves upon current RNG design. The class of DX generators is a special family of MRGs which are highly efficient, highly portable while sharing the nice properties for large order MRGs. In 2005, DX-1597 was found and published that its period length is 1014903 and it is shown to have the equi-distribution property over 1597 dimensions. The disclosed invention further pushes the order of DX generators from 1597 to 7499. DX-7499 generators produce a period of 1069980, representing a dramatic increase over the present record period length, as well as an increase in cryptographic feasibility. These advantages, combined with an equi-distribution over the extremely high (7499) dimension space, make the class of DX generators as one of the most useful and powerful RNGs currently available. The major advantages of the patent includes Large order, portable and efficient, uniform distribution over extremely high dimension space, world record period (approx.  $10^{69980}$ ), and cryptographically strong.



# ALUMNI NEWS

**Jeejung (Cheyenne) Ro** received her M.A.S. (Department of Statistics) and a Ph.D. (Hotel, Restaurant and Institutional Management) at Penn State. She has accepted a position as Assistant Professor at University of Central Florida starting August 2007.



We are planning a new section of the Newsletter devoted to our alumni. Please send us information that we can publish in future newsletters. For example, include your current job and any information that you feel would be of interest to other alumni or those associated with the Department of Statistics. When sending the information, please indicate your permission to have the information printed in Stat News. Please send to [b2a@stat.psu.edu](mailto:b2a@stat.psu.edu).

# STUDENT NEWS

## Awards

### 2006 GlaxoSmithKline Scholar Award

By Naomi Altman, Associate Professor, Department of Statistics

**Gia Barboza**, a doctoral graduate student in statistics, is this year's recipient of the GlaxoSmithKline (GSK) Scholar Award. The GSK Award is a \$1,000 scholarship grant given by the Biomedical Data Sciences (BDS) Department at GlaxoSmithKline Pharmaceuticals primarily to assist statistics departments in their recruitment of outstanding graduate students. Barboza was chosen due to her strong background in law and social sciences that bring an extra dimension to her statistical work, according to the admissions committee for the Department of Statistics. Gia has an MS in Statistics, JD in Law and an MA in Family and Child Ecology, all from Michigan State University, and was an adjunct professor in the Michigan State University Law School with responsibility for teaching "Analytical Methods for Lawyers (Statistics)." As well, she has been the instructor for a number

of courses in quantitative methods and a teaching assistant for courses in political science, family and child ecology and law, has a number of publications and has also had business experience. Amit Bhattacharyya, GSK award liaison, presented the award to Barboza.



*Amit Bhattacharyya, Gia Barboza and Naomi Altman*

The GSK scholarship grant is a one-time award to students chosen by academic department faculty of the Statistical Sciences Group of BDS. Penn State's Department of Statistics is one of ten statistics departments in the United States receiving such an award annually. The GSK Scholar Award has been given to PSU statistics graduate students since 2002. Past Penn State recipients of the GSK Scholar Award are: **Benjamin Haas** (2002); **Trent Gaugler** (2003); **Christian Stopp** (2004) and **Hsiao-Pin (Anderson) Liu** (2005).

### **James D. Cooper Student Award**

By *G. P. Patil*, Distinguished Professor of Mathematical Statistics Emeritus and Director of the Center

Jessica Newlin and *Sham Bhat* have been winners of the James D. Cooper Student Award, presented by the International Bridge Conference, June 2007, for their paper entitled, "Identification and Prioritization of Stream Channel Maintenance Needs at Bridge Crossings." The paper was conceptualized and prepared under the guidance of Professor Patil in the cross-disciplinary classroom and in the Center for Statistical Ecology and Environmental Statistics.

### **Outstanding MAS Student Award**

The Outstanding MAS Student Award for the Class of 2007 was presented to *Lin Li*. Lin was chosen in recognition of her outstanding academic performance and her contribution to student activities.

## **Recent Ph.D.'s and Current Affiliations**

### **Fall 2006**

*Yi-Ju Chen*, Ph.D., Department of Mathematics, National Chung Cheng University, Taiwan.

### **Spring 2007**

*Doh (Joseph) Y. Kang*, Ph.D., is currently at Penn State working as a Research Associate in the Methodology Center and Instructor in the Department of Statistics.

*Yang Wang*, Ph.D., is Associate Program Manager, Decision Management, Citi Cards, Citigroup, Long Island City, NY.

*Hong Xu*, Ph.D., has started her new position as Vice President, Quantitative Finance Analyst, Scorecard Risk Rating, Enterprise Credit Risk with Bank of America.

*Zhe (Bob) Zhang*, Ph.D., has begun his new position Vice President, Quantitative Research Assoc., Enterprise Credit/Global Risk with Bank of America.

### **Summer 2007**

*Bing Han*, Ph.D., started his new position in Fall 2007 as Associate Statistician with the Rand Corporation in Santa Monica, California.

*Hyekyung Jung*, Ph.D., has moved to Texas with her husband, Byungtae Seo, and is currently caring for their baby girl born in August 2007.

*Byungtae Seo*, Ph.D., has accepted a position as Assistant Professor in the Department of Mathematics and Statistics, Texas Tech University, beginning Fall 2007.

*Zhihui Tang*, Ph.D., started his new position as a Biostatistician at PPD (a CRO company) located in Wilmington, NC, in June 2007.

*Jingyun Yang*, Ph.D, Research Fellow, Massachusetts General Hospital and Harvard Medical School, Boston, MA., beginning August 2007.

*Weixin Yao*, Ph.D., started his tenure-track Assistant Professor position in the Department of Statistics at Kansas State University, Manhattan, Kansas in August 13.

*Derek S. Young*, Ph.D., begins his new position as Research Scientist - Irradiations and Statistics Section with Bechtel Bettis of Pittsburgh in November 2007.

## **Recent Masters' Degrees**

### **Fall 2006:**

MAS: *Michell E. Paret* and *Tammy L. Root*

MS: *Mian Huang*

### **Spring 2007:**

MAS: *Bin Hu*

MS: *Jeffrey R. Skinner*

**Summer 2007:**

MAS: *Vuong Bui, Maria D. Burago, Chia-Fang Hsu, Su Chul Kim, Lin Li, Susan A. Peters, Hee Jung Ro, Guanfang Wang, Samantha L. Winter, Xiaopan Yao, and Jingwen Zhang.*

MS: *Kabekode G. Bhat*

## Recent Bachelors' Degrees

**Fall 2006:** *Lauren M. Stein*

**Spring 2007:** *Paul Apibunyopas, Joseph Ho Chung, George G. Hamada, Puja Khare, Michael R. Mack, Megan I. McGee, Matthew W. Olsen, Reed A. Schuyler, and Crystal T. Zhang*

**Summer 2007:** *Casey M. Chojnacki, and Kyle J. Grottini*

### Summer Internships

#### Procedures for an international student to get a summer internship in US

By Dong Yuexiao (Summer (2007) Intern at Statistics and Intelligent Systems (SIS))

- 1. Looking for a summer internship.** Different people may have different things in mind when looking for summer interns. I think it is better to be career related. It helped me a lot financially too since I am paying my wife's tuition. For graduate students in our department, there are plenty of opportunities. From my experience, I can proudly say that most of my fellow students here are qualified for these summer intern openings.
- 2. Interview.** Interview needs both ability and skill. You need to show the interviewer why you are different from other interviewees. Be honest and stay confident. It is OK to go to various interviews to build up confidence and acquire experience when you are still available. It is very bad to go to interviews when you have little intention to go even if you can get the offer. It is a waste of time for both parties. In my case, when I made up my mind to go to Lubrizol for the summer, I let GSK know immediately since they were still trying to set up interviews for me. The timing of the first two steps may vary; but, the earlier, the better. Some companies, e.g. Merck, fill some of their summer intern positions the previous year. It is also true that these companies have new programs coming out all the time which means opportunities may arise at the last minute. In my case, this summer, Lubrizol interviewed lots of candidates from OSU and Virginia Tech and could not find an appropriate one. That's how I got lucky and received an offer from them at the very end of April.
- 3. Pre-employment physical test and background check.** These are becoming standard. The offer is always contingent on the results.
- 4. Offer letter received.** Go to OISS (Boucke 4th floor) with the offer letter. Certain details need to be included in the letter, e.g. date, payment, job description. It is not uncommon to ask your employer to update the offer letter. Get a form for CPT (curricular practical training). Go back to your academic advisor to fill the form. Don't forget to register for a summer course like individual study or thesis research, because CPT is required to be credit-bearing. You need to be careful here because your advisor might not be aware of that.
- 5. With the application form for the CPT,** OISS will update your I-20. Bring this new I-20 and passport to your job. Then enjoy the summer!!

Some additional thoughts: summer time is critical for research. Here is the tradeoff---However important the experience is that you have gained from a summer internship, there is always the cost to the research ability you might have enhanced during the same time period. Every coin has two sides.

An important reminder: For international students, the upper limit of a CPT is 12 months.

You may lose your OPT after graduation if you go over this limit.

# DEPARTMENT EVENTS

## Ninth Alumni Workshop

By Alumni Workshop Committee:

**Andreas Artemiou, Maggie Li, Yeojin Chung, Hsiao-Pin Liu** (Co-Chair), **Yijia Feng, Jianping Sun, Huei-wen Teng,** and **Matthew Tibbits**



The Ninth Alumni Workshop took place on Thursday, March 29 and Friday, March 30, 2007. All talks were held in the Eisenhower Auditorium on Thursday.

Dr. **Bruce Lindsay**, Department Head, gave a brief welcome address at 9AM. Then, Dr. **Rosenberger** introduced the keynote speaker this year, Ms. **Duanli Yan**. A delightful part of the introduction was showing the audience a couple of pictures of Duanli that were taken twenty years ago. Ms. Yan, who graduated from the Statistics Department with a Master's degree in 1989, has been working with Education Testing Service (ETS) for over 17 years. In the first half of her presentation, she recalled her study at Penn State and expressed her sincere appreciation to Professors **Arnold**, **Harkness** and **Rosenberger**. Later she discussed what statistics had to do with testing. After her lecture, the faculty member, Dr. **Murali Haran**, gave a talk entitled 'Computation and Crop Epidemics.' The other two speakers in the morning session were alumnus, Mr. **Shayne Noyes** from HSBC Bank and postdoc, **Joseph Kang**. Mr. Noyes shared his experience in industry with students while Dr. Kang discussed his research about causal inference by semiparametric imputation. During the afternoon break, ice cream from the Penn State Creamery was provided. Speakers took this time to review the five posters which were entered in the poster competition and hanging over the windows. Finally, the keynote speaker, Ms. Yan, gave a more statistical related presentation. Afterwards, she interviewed students who were interested in the opportunities at ETS. An evening reception was held in the Willaman Gateway. Dr. Lindsay announced the prize winners of the poster competition; Ruth **Hummel** and Dr. **Hettmansperger** won the first prize while **Jeffery Skinner** and Dr. **Altman** received the second prize. The Workshop provided ample opportunity for current and potential students, faculty, and speakers to chat in a friendly atmosphere while enjoying the delicious food. On Friday, Mr. Noyes from HSB Bank and Mr. Shoemaker conducted interviews of interested students.



\*Tenth Alumni Workshop\*  
tentatively scheduled for April 3, 2008

# Workshop on Matrix Theory and Applications in Physical Biological and Social Sciences

The Workshop, organized by The Center for Multivariate Analysis, took place on July 27-29, 2006. The venue of the workshop was Thomas Building on the Penn State campus. **Daniel J. Larson**, Dean of the Eberly College of Science, opened the Workshop by presenting the P. R. Krishnaiah Visiting Scholar citation to **Gene H. Golub**, Fletcher Jones Professor of Computer Science, Stanford University, and the C. G. Khatri Visiting Scholar citation to **Thomas Kailath**, Hitachi America Professor Emeritus of Engineering, also of Stanford University. Dr. Golub presented a talk entitled

‘Matrices and moments: Perturbation for least squares.’ Dr. Kailath’s presented a talk on ‘Array algorithms for signal processing.’ Other talks on the program were given by **C. R. Rao**, **Jeffrey Hunter**, **M. B. Rao**, **J. L. Barlow** and **A. Chandrasekhar**.



## Statistics Day and 2007 C.R. and Bhargavi Rao Prize Award Ceremony



*Karin Foley, Associate Dean, presenting award to Lawrence Brown*

The C.R. & Bhargavi Rao Prize was established to honor and recognize outstanding and influential innovations in the theory and practice of mathematical statistics, international leadership in directing statistics research, and pioneering contributions by a recognized leader in the field of statistics. The prize is awarded by the Statistics Department to a nominee selected by the members of the Rao Prize Committee. The Prize is awarded in odd numbered years to an individual working in the United States. This year’s award recipient was Lawrence D. Brown, Miers Busch Professor and Professor of Statistics at the University of Pennsylvania. The Rao Prize Committee, chaired by Professor Donald Richards, organized a very interesting program with talks by Professor Brown, Eitan Greenshtein (SAMSI and UNC-Chapel Hill), and several presentations by graduate students in the Department of Statistics.



*Bruce Lindsay, Lawrence Brown, C. R. Rao*





# 2007 Clifford C. Clogg Memorial Lecture in Sociology and Statistics

March 26, 2007

This year *Yu Xie*, Professor of Sociology and Statistics at the University of Michigan, presented the lectures. The lunchtime presentation was entitled 'Population Heterogeneity and Causal Inference.'

**Abstract:** Yu Xie argues that the very objective of social science is not to discover abstract and universal laws but to understand population variability. He calls this "Variability Principle." Causal inference with observational data in social science is impossible without strong assumptions. There are two potential sources of bias. The first is bias in unobserved pretreatment factors affecting the outcome additively. The second is bias due to heterogeneity in treatment effects. The first potential source of bias is usually handled with either collection of new data or unique design features (such as fixed effects models). Our understanding of the second source of bias is so far inadequate. In this presentation, Yu Xie discusses a simple scenario of "composition bias," which is a form of selection bias, under the classic assumption of ignorability. Both simulation and empirical examples are given.

The Clifford C. Clogg Memorial Lecture entitled, 'The Three Principles in Social Science,' was presented in the afternoon.

**Abstract:** In this presentation, Yu Xie argues that the very objective of social science is not to discover abstract and universal laws but to understand individual and contextual variabilities in populations. Thus, a fruitful quantitative paradigm for social science should not imitate physical science to be "exact." Rather, it should borrow Darwin's evolutionary biology and call for empirical research that yields valid and informed understanding of actual social phenomena, social processes, and human behaviors. Three basic principles for social science research are proposed. First, variability is the very essence of social science. Second, social grouping reduces such variability. Third, patterns of population variability may vary with social context, which is often defined by time and space. For illustration, Yu Xie discusses implications of regression analysis with survey data—the predominant mode of quantitative inquiry in social science.

The lecture was followed by a reception in the Willaman Gateway (Life Sciences Building).

## PERSONAL CORNER

**Chris Stahl**, Manager of Network and Information Systems, and Candy Bryan were married on October 7, 2006.

**kb Boomer** (Director, Statistical Consulting Center (until June 2006)) and husband, Rick Brazier, were blessed with a new infant over the winter break. Margaret Elizabeth "Maggie" Boomer Brazier, was born on December 20, and it was her good fortune to be placed in kb's and Rick's custody on December 22nd.

**Laurie Roan** (Secretary to the Department Head) welcomed her new grandson, Owen, born on September 6, 2007.

**Makhtar Sarr** (Ph.D. 2006) announced the birth of his baby girl on August 9, 2007.

**Byungtae Seo** (Ph.D. 2007) and Hyekyung Jung (Ph.D. 2007) are the proud parents of a baby girl, Eileen Hyunji Seo, born on August 17, 2007.



# CONTRIBUTORS July 1, 2006—June 30, 2007



Dr. Steven F. Arnold & Mrs. Rana McMurray Arnold  
Mr. Scott D. Beattie  
Mrs. Tracy L. Bendinsky & Mr. Scott C. Bendinsky  
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## Millennium Society Contributors

Mrs. Yildiz H. Akin and Dr. William L. Harkness  
Dr. Bruce G. Lindsay & Dr. Laura J. Simon  
Mrs. Gloria H. Rosenberger & Dr. James L. Rosenberger  
Mr. Stuart J. and Barbara Green Scheffler

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