Odds & Ends

Summer 2011

Department of Statistics Newsletter

Felix Haas Hall

Mathematical Sciences Building

PURDUE
UNIVERSITY

Letter from the Head

Dear Alumni and Friends of Purdue Statistics:

Purdue Statistics has had a great year! Professor Rob Tibshirani (Stanford University), a recent guest of the statistics graduate students, said it best, "It's a great time to be a statistician. We are so relevant right now." I cannot agree with Rob more. Our students, faculty, and alumni continue to participate in exciting work that is making a difference, solving problems, and continuing to support foundational statistical theory and probability.

During my first year as head, Purdue Statistics has experienced many firsts. To name only a few of these firsts, a record FIVE assistant professors were promoted to associate professor with tenure (Xiao Wang, Vishwanathan (Vishy) Swaminathan Venkata Narayana, Olga Vitek, Bowei Xi, and Min Zhang); three faculty (Alan Qi, Olga Vitek, and Dabao Zhang) hold NSF CAREER awards; continuing lecturer Ellen Gundlach won "Course of the Year" for the online version of STAT 301 from the Indiana Council for Continuing Education (ICCE); undergraduate Thomas Nielsen was president of the Purdue Paint Crew, named for basketball coach Matt Painter and one of the largest student organizations on campus, whose goal it is to be the loudest supporters of Purdue Boilermakers; and Purdue Statistics together with Computer Science will host the first Machine Learning Summer School from June 13-24, 2011.

As I reflect on the challenges of this year and anticipate the challenges of next year, I am reminded of the strength and vision we have built in Purdue Statistics. Our mission is to provide leadership in the statistical sciences by:

- Research – Advancing theory, methods, and computing to further emerging science and technology
- Teaching – Providing students with the statistical and computational skills necessary to handle complex real-world problems, through innovative courses and teaching technologies
- Outreach – Elevating awareness, enriching education, and strengthening research on campus and in the wider community.

In anticipation of next year, we are excited to showcase our strength and vision in modern Statistics by hosting the "Eighth Purdue International Symposium on Statistics" to be held June 20-24, 2012 in the Stewart Center, Purdue University (details forthcoming: www.stat.purdue.edu). Questions about the symposium can be directed to Ms. Diane Martin (martindl@purdue.edu). Donations to support the symposium can be made to Purdue University and postal mailed to Diane Martin at 250 N. University Street, Department of Statistics, Purdue University, West Lafayette, IN 47907-2066 USA.

As you make your plans for the 2011 Joint Statistical Meetings (JSM) in Miami, Florida, please join our friends, alumni, faculty, and students at the JSM Purdue Reception which will be hosted by me and our new director of development, Ms. Julie Paolillo (jpaolill@purdue.edu). It is scheduled for Sunday, July 31, 2011 at 6:30 p.m in the Venus Room of the Loews Miami Beach Hotel. Please RSVP to Holly Graef at hgraef@purdue.edu or (765) 494-6030 by July 15 if you plan to attend. Children and families are welcome!

Go Boilers!

Rebecca W. Doerge

2011 Distinguished Science Alumnus Vaidyanathan Ramaswami

Vaidyanathan (Ram) Ramaswami (MS, 1976, statistics; PhD, 1978, statistics) was selected as the 2011 Distinguished Science Alumnus by the Department of Statistics and the College of Science. Ramaswami was presented with the honor at the College of Science's Distinguished Science Alumni awards program on Friday, April 8th, 2011. The awards were established in 1990 to recognize outstanding achievement by Science alumni in professional and related fields of endeavor.

Vaidyanathan Ramaswami is a major contributor to algorithmic methods in probability and their application to communications engineering. He is credited with discovering some of the fastest algorithms and recurrence relations for wide classes of Markov chains and Markov renewal models, as well as many other theoretical advances including the new class of bilateral phase type distributions, a duality theory connecting two major classes of applied probability models, a substantial generalization of the celebrated Pollachek-Kinchin formula for waiting times, and recently a novel way of analyzing stochastic fluid flow models via matrix geometric methods.

Ram has published over 60 articles on his statistical contributions in major journals and has also co-authored (with Guy Latouche) a much-cited book, *Introduction to Matrix Analytic Methods in Stochastic Modeling* published by SIAM and ASA. In addition to his publications, Ram has applied his methods to many practical problems in communications engineering resulting in many patents and work incorporated into several international standards. Examples of these are his work on error monitoring algorithms for signaling links that led to improved standard for high speed signaling links and a recent characterization and analysis of WiFi hotspot traffic. A work of his on congestion control was selected as a finalist in the INFORMS Wagner Prize contest and involves assuring access to emergency 911 services.

Ram has been featured as a keynote and invited speaker at several major international conferences, serves as an editor of *Stochastic Models*, and is a member of several technical and professional organizations, including IMS, INFORMS, and IISA. After many years at Bell Communications Research in which he rose to the position of chief scientist, Ram now works at the Department of Statistics, AT&T Labs - Research. Among the many honors he has received is his selection as the 2001 Ramanujan Memorial Lecturer at Anna University, Chennai, India, in the city of Ramanujan.

Pictured from right to left: Distinguished Science Alumnus Vaidyanathan (Ram) Ramaswami; Rebecca W. Doerge; Soundaram Ramaswami (Ram's wife); Prem Ramaswami (Ram's son); Shruti K. Ramaswami (Prem's wife).

2010 Outstanding Statistics Alumna
Karen Snepp

R.W. Doerge and Karen Snepp

Ms. Karen Snepp received the **Statistics Outstanding Alumni Award** from Purdue University, Department of Statistics in September 2010.

Ms. Snepp's extensive career in statistics began in 1981. Most recently, she was director of consumer research with Expedia, from which she retired in June of last year. Other highlights of her career include notable positions within Carnation Company, PepsiCo Inc., and Information Resources, Inc. Ms. Snepp received a BS in statistics from Purdue University in 1979. She went on to acquire a Masters of Management from the Kellogg Graduate School of Management at Northwestern University in 1981, where she also received the distinction of being an Austin Scholar. While at Purdue, Karen was also active as the president of Alpha Phi Omega service fraternity and enjoyed working part-time as a student assistant in Purdue's Sports Information department.

From left to right: Karl and Sue Snepp (Karen's parents), Karen Snepp, Avis and Virgil Anderson (Emeritus Professor of Statistics)

To read more about Karen Snepp, read her *Alumni Profile* at: http://www.stat.purdue.edu/people/alums/profiles/karen_snepp.html

Campus Tour!
From left to right: Outstanding Statistics Alumna Karen Snepp, Tim Clough (current statistics PhD student), 2010 Actuarial Science Outstanding Alumnus Bruce Bradley and his wife Regina, Eric Krafcheck (recent actuarial science graduate)

2011 Statistics Alumni Advisory Board

Pictured left to right: David Himmelberger, Betsy Hughes, Jing Shyr, Dominic Reda, Meghan Honerlaw, Marcey Hoover, Charles Amewou-Atisso, and Vaidyanathan (Ram) Ramaswami.

The Statistics Alumni Advisory Board (SAAB) met May 19-21, 2011. Members of the SAAB provide leadership, counsel, and connections to resources essential to the progress and advancement of the Department of Statistics, Purdue University. This year the SAAB heard presentations from Jeff Beckley (Actuarial Sciences), Mickey Latour (Online Learning), and Bruce Craig (Statistical Consulting Service). They also enjoyed research presentations from Mark Ward and Hao Zhang, and a presentation and tour of the department's facilities from the leadership of STATCOM. The Statistics Alumni Advisory Board will reconvene May 2012.

Joint Statistical Meetings 2010

Friends, alumni, faculty and students gathered on the evening of Sunday, August 1, 2010 in the beautiful Terrace Room of the Fairmont Waterfront Hotel in Vancouver, British Columbia, Canada, for the Purdue Statistics Friends and Alumni Reception. Rebecca Doerge welcomed everyone and provided a year in review of the Department of Statistics. Associate dean and professor George McCabe provided an overview of the College of Science. A great time was had by all, and we look forward to another great party on July 31, 2011 (Sunday; 6:30pm; Venus Room of the Loews Miami Beach Hotel) at the Joint Statistical Meetings in sunny Miami, Florida.

Please see www.amstat.org/meetings/jsm/2011 for more information about this year's meetings.

Alumni Updates

H. Leon Harter (PhD, 1984) of Savoy, Illinois passed away on March 3, 2010, at the age of 90. He received his PhD in mathematical statistics from Purdue University, and retired from Wright State University in 1984. Professor Harter was an expert in the field of order statistics. He authored an eight-volume bibliography on order statistics, was an elected Fellow of both the American Statistical Association and the Institute of Mathematical Statistics, and a member of the International Statistical Institute.

Dipak K. Dey (MS, 1977; PhD 1980), Board of Trustees Distinguished Professor at the Department of Statistics, University of Connecticut, will be stepping down as head of the department and will join the administration of the College of Liberal Arts and Sciences at UConn as associate dean (Physical Sciences). In addition to his duties overseeing the Physics, Chemistry, Mathematics, Geo-Sciences, Marine Sciences and Statistics Departments, Professor Dey will also be taking care of graduate education within the College of Liberal Arts, international program development, and fostering interdisciplinary research within the University.

The **2012 Eighth Purdue International Symposium on Statistics** will be held June 20-24, 2012 at Stewart Center on the Purdue West Lafayette campus. Stay tuned to our web site: **www.stat.purdue.edu** for upcoming details.

Dear Alumni:

Have you visited the Department of Statistics Web page yet? On these pages, you'll find information about alumni events, news from the department and from other alumni, Statistics Distinguished Alumni award recipients, and alumni profiles.

You can check out the alumni Web pages by visiting http://www.stat.purdue.edu/people/alums. We love to hear about what's been happening in your life, so if you have news to share with us or would like to update your information with us, you can submit your news online by following the "Send Us Your News/Update Your Information" link found on the alumni page.

Is there something you'd like to see on these pages? Please let us know by sending your suggestions to webmaster@stat.purdue.edu.

Welcome New Faculty, Visitors and Staff

Sharon Christ joined the Department of Statistics as an assistant professor of Child Development and Family Studies (75%) and as an assistant professor (25%) of statistics. She received her PhD in sociology in 2008 and her MS in statistics in 2004 from the University of North Carolina at Chapel Hill. Her research interests include Scale Reliability Estimation and Testing using Longitudinal, Latent Variable Modes; Multilevel Modeling of Samples with Unequal Selection Probabilities; and Optimal Probability Weighting Methods in Trajectory Models for Data with Nonignorable Unequal Selection and Wave Nonresponse.

Hyonho Chun joined the department as an assistant professor of statistics. She received her PhD in Statistics in 2008 from the University of Wisconsin at Madison, and completed a postdoc in Biostatistics at Yale University in 2010. Her research interests include Network inference and covariance estimation for high dimensional data; statistical genomics; statistical theory and methods for correlated high dimensional low sample size data; and nonparametric function estimation and machine learning.

Eric Imboden joined the department as the web administrator. This is a shared position (50-50) with the Department of Physics. He received his Bachelor of Arts in technical writing (specialty in computer science) from Purdue University in 1991. Since that time, he has held positions with Ernst & Young, Eli Lilly and Company, and other firms as technical writer, technical support specialist, and web designer/developer.

Heon Joo Kim joined the department as a visiting scholar. She received her PhD in statistics in 1995 from Kyungpook National University. Professor Kim is interested in undergraduate instruction and will be observing/discussing many of our undergraduate classes. She first visited Purdue University as a visiting scholar in 1996.

Eric Muffley joined the department this summer as the windows systems administrator. He received his master's in public management in 2009 and his bachelor's in computer information systems in 2004, both from Indiana University, his associate's in computer technology from Purdue University in 2004, and an associate's in computer information systems from Ivy Tech Community College in 2002.

Welcome New Faculty, Visitors and Staff

Gayla Olbricht joined the department as visiting assistant professor of statistics. She received her PhD in statistics in 2010 from the Department of Statistics, Purdue University. Her research interests include statistical bioinformatics, epigenomics, and differential expression analysis for gene expression and tiling array data. She is working with professor R.W. Doerge, and was the assistant director of the Statistics Consulting Service in the fall 2010 semester.

Julie Paolillo joined as director of development for the departments of statistics and biology. She received her bachelor's degree in consumer and family sciences from Purdue in 1994 and most recently was the director of development for chemical engineering.

Birth Announcements

PhD student **Juan Hu** and her husband, Lian Peng, welcomed a baby boy, Mike Peng, on September 1, 2010.

Assistant professor **S.V.N. Vishwanathan** and his wife, Tao Wang, welcomed a daughter, Lakshmi Iyer, on October 26, 2010.

Graduate secretary **Becca Miller** gave birth to a daughter, Macie Lynn, on February 25, 2011. Her son, Bryce Mitchell, is thrilled to have a baby sister.

Assistant professor **Sharon Christ** gave birth to a boy, Calvin Robert Langager, on April 21, 2011. She and her husband, Robert Langager, now have three sons.

Windows systems administrator, **Eric Muffley**, and his wife, Denise Herold-Muffley, welcomed their first child, Miya Roma Muffley, on May 6, 2011.

Accomplishments

George McCabe, professor of statistics and associate dean for academic affairs, is among the six professors included in a partnership to prepare students to handle data produced by new technologies in science. The Howard Hughes Medical Institute awarded a $1.5 million, four-year grant to the team headed by Dennis Minchella, professor and associate head of biological sciences, for this multidisciplinary project to integrate statistical reasoning and data evaluation into the undergraduate biology curriculum.

Mary Ellen Bock receives NISS Distinguished Service Award for 2010 and is profiled in Purdue Today for work with ADVANCE

Professor **Mary Ellen Bock** was featured this October in the new Purdue Today Profiles section for her work with ADVANCE-Purdue. ADVANCE is a National Science Foundation program designed to develop systemic approaches to increase the representation and advancement of women in academic science, technology, engineering and mathematics (STEM) careers, thereby contributing to the development of a more diverse science and engineering workforce. You can learn more about the ADVANCE-Purdue initiative at http://www.purdue.edu/dp/advance/.

Bock received the National Institute of Statistical Sciences (NISS) Distinguished Service Award for 2010 at the Joint Statistical Meetings in August. She is recognized with this award for the seminal role she played in the formation of the affiliates program at NISS.

A new textbook written by Liang, Liu, and Carroll

Professor **Chuanhai Liu** and his colleagues professors Faming Liang and Raymond J. Carroll (both from the Department of Statistics, Texas A&M University) have authored the text *Advanced Markov Chain Monte Carlo Methods: Learning from Past Samples.* The text is part of the Wiley Series in Computational Statistics.

Markov Chain Monte Carlo (MCMC) methods are now an essential component of the standard set of techniques in scientific computing. This book discusses recent developments of MCMC methods with an emphasis on those making use of past sample information during simulations. The application examples are drawn from diverse fields such as bioinformatics, machine learning, social science, combinatorial optimization, and computational physics. Read more at: http://www.wiley.com/WileyCDA/WileyTitle/productCd-0470748265.html.

Accomplishments

McCabe, Craig, and Zhang recognized at Excellence in Research Awards Dinner

George McCabe (professor of statistics and associate dean for academic affairs), **Bruce Craig** (professor of statistics, director of statistical consulting, associate department head), and **Min Zhang** (assistant professor of statistics), were among the many Purdue researchers honored at the Excellence in Research Awards Dinner in November 2010. All three were recognized during the Seed for Success portion of the program. The Seed for Success awards are given in recognition of the accomplishments of single investigators or teams of investigators for their efforts in obtaining research grants of $1 million dollars or more.

McCabe, along with Connie Weaver of Purdue's Department of Foods and Nutrition, was recognized for two separate grants. The first is a $2,053,264 multi-year grant from the PHS-NIH National Institute of Child Health and Human Development for the study Calcium Metabolism in Mexican American Adolescents, and the second is a $1,077,209 multi-year award from the University of Georgia for the study *Supplemental Vitamin D and Functional Outcomes in Early Adolescence.* **Craig** is a member of a research team awarded a multi-year grant totalling $1,112,313 from the PHS-NIH National Institute on Aging for their study *Prognostic Significance of Insufficient ADL Help on Health Outcomes/Utilization*. **Zhang** is part of a group of researchers awarded a $1,304,452 multi-year grant from the National Science Foundation for their study entitled *TRMS: From Ionome to Genome: Mapping the Gene Networks Controlling Nutrient Content in Rice Grain.*

Alan Qi receives CAREER award

Assistant professor **Yuan (Alan) Qi** is the recipient of a Faculty Early Career Development (CAREER) Award from the Information & Intelligent Systems Division of the National Science Foundation (NSF). NSF offers its most prestigious awards through the CAREER program to recognize and support junior faculty's development for a lifetime of leadership in high-quality research and integration of research and education. Alan's award for "Scalable Bayesian learning for multi-source and multi-aspect data" (with the total budget $511,803 from January 2011 to December 2015) will support his research program that is focused on bringing together models and techniques encountered in a variety of areas, such as nonparametric Bayesian statistics, parallel inference, and systems biology, to develop new methodologies and tools for multi-source and multi-aspect data analysis.

Accomplishments

Olga Vitek receives CAREER award

Olga Vitek, assistant professor of statistics and computer science, was awarded a grant by the Faculty Early Career Development (CAREER) Program from the Division of Biological Infrastructure (DBI) of the National Science Foundation (NSF). This prestigious award supports junior faculty who exemplify the role of teacher-scholars through outstanding research, excellent education, and the integration of education and research, to build a firm foundation for a lifetime of leadership in integrating education and research.

Olga's award "CAREER: Sparse-sampling inference for functional proteomics, metabolomics and ionomics" is effective between April 2011 and March 2016 with a total budget of $546,822. It will support the development of statistical and computational tools for functional proteomics, metabolomics, and ionomics, with the goal to increase the sensitivity, accuracy, and scope of the investigations. The activities will contribute to bridging the communication gap between biologists, chemists, and statisticians, and promote the computational thinking and the appropriate use of statistical methodology.

Members of department honored at College of Science Faculty and Staff Awards Program

Congratulations to the following faculty and staff members who were recognized at Purdue's College of Science Faculty & Staff Awards program and luncheon, held in honor of their achievements, service, and dedication. The program was held on February 23rd, 2011, in the Purdue Memorial Union.

Jun Xie, associate professor of statistics and graduate chair, received the Graduate Mentoring Award for her dedication and service as chair of the graduate program in statistics, and for the impact she is having on the lives and education of statistics graduate students.

The following faculty members were recognized for their work in establishing and promoting the interdisciplinary science of Machine

Learning and Computational Statistics at Purdue University: **William S. Cleveland** (Statistics), **Sergey Kirshner** (Statistics), **S.V.N. Vishwanathan** (Statistics/Computer Science), **Jennifer Neville** (Statistics/Computer Science), **Yuan (Alan) Qi** (Statistics/Computer Science), **Luo Si** (Computer Science), **Chris Clifton** (Computer Science) and **Bob Givan** (Electrical and Computer Engineering).

Dean Jeffrey Roberts, Jun Xie, and Bruce Craig

William S. Cleveland, Chris Clifton, Sergey Kirshner, Dean Jeffrey Roberts, Alan Qi, S.V.N. Vishwanathan, Bruce Craig (not pictured: Bob Givan, Jennifer Neville, Luo Si)

Accomplishments

The Shared Faculty Staff Award was given to the following for their commitment to furthering the education of Purdue undergraduates through recruiting and preparing students for the 5th year Masters in Statistics program: **Stacey Dunderman**, **CeCe Furtner**, **Becca Miller**, **Mark Daniel Ward**.

Stacey Dunderman, CeCe Furtner, Dean Jeffrey Roberts, Becca Miller, Mark Daniel Ward, Bruce Craig

Sandy Howarth, former director of development for the Departments of Statistics and Biology, was awarded the Customer Service Award. This award is shared between the departments of Statistics and Biology and is given in recognition of service and dedication to philanthropic interests of both departments.

Dean Jeffrey Roberts, Sandy Howarth, and Bruce Craig

Guang Cheng elected as member of ISI

Assistant professor **Guang Cheng** was selected as an Elected Member of the International Statistical Institute (ISI). The International Statistical Institute (ISI) is one of the oldest international scientific associations functioning in the modern world. Its first congresses were convened in 1853, and it was formally established in 1885. The Institute is an autonomous society which seeks to develop and improve statistical methods and their application through the promotion of international activity and co-operation. Cheng joins professors **Mary Ellen Bock**, **William S. Cleveland**, **Jayanta K. Ghosh**, **Chuanhai Liu**, **David S. Moore**, **William J. Studden**, **Hao Zhang**, and assistant professor **Bo Li** as members of the ISI.

Accomplishments

Li Awarded Purdue's Teaching for Tomorrow Award

Bo Li, assistant professor of statistics, has been awarded the Teaching for Tomorrow Award for 2011-2012. She will be one of ten assistant (or newly promoted associate) professors matched with two experienced faculty mentors who will, over the next year, address important topics and experiences related to teaching and student learning. The program provides each participant with faculty development funds.

Li joined the department in 2008. She received her PhD in statistics from Texas A&M University in 2006, and was a postgraduate scientist at National Center for Atmospheric Research during 2006-2008. Her primary research areas are spatial statistics, statistics in environmental sciences, climatology and public health. At Purdue, she has taught Applied Linear Regression, Introduction to Time Series, Statistical Inference, and Spatial Data Analysis. She enjoys both teaching and research at Purdue Statistics.
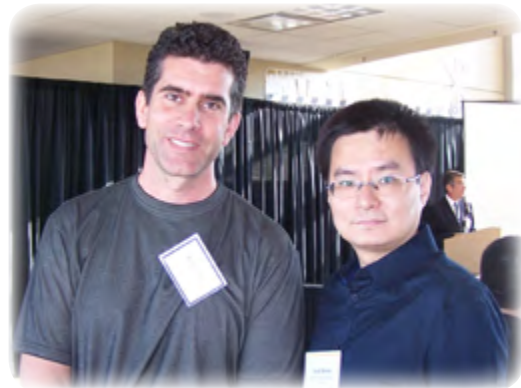
Stat 301 Wins ICCE Course of the Year

We are proud to announce that the online version of STAT 301 (taught by continuing lecturer Ellen Gundlach) won "Course of the Year" for the Indiana Council for Continuing Education (ICCE). The criteria for the ICCE Course fo the Year require either a credit or noncredit course/program offered by the continuing education unit of an ICCE-member institution. The course must demonstrate that it contributes to the enhancement of educational opportunities of individuals in the community and provides an innovative approach to providing education programs. The online version of STAT 301 was nominated for this award by Mickey Latour, the assocatiate dean for distance learning.

Wang nominated for CETA Award for Excellence in Teaching

Yong Wang, a PhD student in the Department of Statistics, recently received the department's nomination for the Committee on Education of Teaching Assistants (CETA) Award for Excellence in Teaching. This award is given each year by CETA and the Office of the Provost. Students are nominated by their departments. Each winner receives a plaque, then all recipients become eligible to receive the Graduate School Excellence in Teaching Award.

Professor Bruce Craig and Yong Wang

Accomplishments

Ellen Gundlach is the Grand Prize winner of the American Statistical Association's Hands-On Statistics Activity competition. The ASA participated in the USA Science and Engineering Festival October 23-24, 2010 in Washington, D.C. with the intention of stimulating an interest in statistics in children and teenagers. Ellen's original activity involved flying, measuring time and distance, graphing, and comparing several different paper airplane designs. This activity was used by STATCOM K-12 Outreach at Spring Fest at Purdue in April 2010 and with the Math/Science/Statistics Club at Frontier Elementary School in 2009.

Ellen Gundlach at Spring Fest, April 2010

Ellen Gundlach and participants in parachute activitiy at the USA Science and Engineering Festival October 2010.

Due to National Park Service restrictions for the festival, the activity had to be adapted (on short notice) to work vertically instead of horizontally, and she compared 4 types of parachutes instead of 4 paper airplane designs.

Ellen enjoyed working with ASA staff, especially Rebecca Nichols, the K-16 Outreach Coordinator, and meeting families from across the country. She even got the thrill of seeing Bill Nye the Science Guy, Einstein, Ben Franklin, Galileo, and Cheerleaders for Science. Her sons, Philip (12) and Callum (9), were excited about exploring science, engineering, and math in such a hands-on way with people who are passionate about their fields. Fifty thousand children were expected to attend the festival.

Ellen is a continuing lecturer and the course coordinator for STAT 301 and STAT 225. She has been teaching statistics at Purdue since 2002. Ellen loves to involve students through laughter and movement (activities are even outside) when learning about how to use statistics. She regularly incorporates paper airplanes (the winning activity), dice, card tricks, cookies, M&Ms, gummy bear catapults, and ESP testing in her lectures.

Ellen holds a B.S. in chemistry from Florida State University and a Masters in chemistry from The Ohio State University. She is the associate editor for MERLOT and CAUSEweb, and the author of several supplements for W.H. Freeman. At Purdue her interests include online teaching, using writing in introductory statistics courses, using fun hands-on activities in introductory courses, mentoring teaching assistants , being the STATCOM (Statistics in the Community) K-12 Outreach faculty advisor, and finding creative ways to prevent and catch academic misconduct. She is a member of Purdue's Teaching Academy.
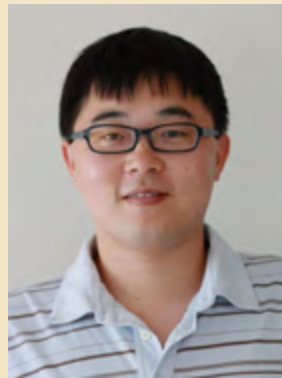
Promotions

This year we are proud to announce that in the Department of Statistics a record FIVE assistant professors were promoted to associate professor with tenure. The promotions will go into effect August 15.

Congratulations to:

Olga Vitek

Xiao Wang

Bowei Xi

Vishwanathan (Vishy)
Swaminathan Venkata Narayana

Min Zhang

The **2012 Eighth Purdue International Symposium on Statistics** will be held June 20-24, 2012 at Stewart Center on the Purdue West Lafayette campus. Stay tuned to our web site: **www.stat.purdue.edu** for upcoming details.

Research Profile: Mark Daniel Ward

The algorithms used to analyze large data sets are becoming increasingly complex and therefore often require large amounts of computational time. Professor Mark Daniel Ward understands that asymptotic analysis of algorithms is of crucial importance for investigation of large data sets. He studies the precise time and memory required by algorithms and data structures on strings and trees. This area of study lends itself well to professor Ward's experience in theoretical computer science. His research yields precise mathematical descriptions of the asymptotic properties, rather than bounds on the performance. Due to the randomness involved in the data sets and the operations of some algorithms, his background in probability theory complements these applications.

Mark Daniel Ward, assistant professor of statistics, associate director of actuarial science, and undergraduate chair

"Data sets investigated today are really large. Even though computers have large memory capacities, merely having upper bounds on asymptotics will result in an over allocation of valuable memory. Furthermore, scientists working with large data sets—from biologists to economists—are also interested in more precise asymptotics," explains Ward. He also has research interests in applied probability theory, including leader election algorithms; pattern matching algorithms and data structures; data compression; information theory; game theory; and large-scale, parallel computation.

Ward is also especially fond of interdisciplinary problem solving, in which problems from one subject are solved using apparently unrelated methods. For instance, in spring 2010, he solved one of Herbert Wilf's eight "Unsolved Problems." The problem was to determine the precise asymptotic properties of a method for approximating Pi. His solution utilized methods from a different area of mathematics—complex analysis—in particular, singularity analysis, a Hankel contour, and transfer theorems.

In addition to his research in analysis of algorithms, Ward has a very active role as the chair of the Undergraduate Committee in statistics. One of his goals is to have an especially welcoming culture for students in the mathematical sciences. He is also the associate director of the Actuarial Science Program, which has doubled in size in the last five years. Further, he is committed to growing the Fifth Year Masters Program where students pursuing an undergraduate major in mathematical statistics can earn a masters degree in statistics with only one additional year of study.

A small cohort of faculty at Purdue are invited to teach for the University Honors Program (UHP), which features courses limited to 20-30 students. In fall 2009, Ward's "Lies, Damned Lies, and Statistics" program was the first course in the mathematical sciences offered by the UHP. In fall 2010, he is introducing a second new course for the program, called "Probability: The Science of Uncertainty."

Mark received his Ph.D. in mathematics with specialization in computational science from Purdue University in 2005. He was a lecturer for two years in the Department of Mathematics, University of Pennsylvania. In 2007 Mark joined the Department of Statistics, Purdue University as an assistant professor. Currently, he is a senior personnel member of the newly founded National Science Foundation Science and Technology Center on Emerging Frontiers of Science of Information, for which Purdue University is the lead institution. For more information about Mark Ward, please visit his homepage: http://www.stat.purdue.edu/~mdw.

By Jeremy Troisi, PhD candidate in statistics

Research Highlight: Spatial Statistics

(Editor's note: This article is the first in a series that will highlight different areas of research currently being conducted by our faculty.)

By Hao Zhang, professor of statistics, professor of forestry and natural resources

Spatial statistics consists of methods for the collection and analysis of spatial data, i.e., data collected at different spatial locations. One of the earliest and well known examples of spatial analysis is due to John Snow who, in 1855, identified the cause of cholera by mapping the incidents of the deadly disease in London, England. The map (shown here) illustrated that nearly all the deaths had taken place within a short distance of the Broad Street pump. His analysis established the strong connection between the source of water and cholera cases. The widespread use of spatial statistics began in the mining industry in the middle of 20th century.

Spatial statistics today is one of the hot areas in statistics because of its applications in public heath, epidemiology, hot spot detection, environmental studies and climatology. These applications in turn raise some challenging issues in statistical methodology and computing. Study of these issues often needs the novel application of mathematics and advanced computing. Hence, in spatial statistics, theory and application coalesce.

The Department of Statistics has a growing group of faculty and students actively working on spatial statistics that not only study theory and methods for the modeling and analysis of spatial data, but also actively collaborate with faculty from other disciplines. Their research is supported by grants from the National Science Foundation, United States Department of Agriculture, Department of Energy, and by private industries.

Map by Dr. John Snow showing clusters of cholera cases in the 1854 Broad Street cholera outbreak.
(Courtesy of Wikimedia Commons.)

Announcements

Statistical Consulting Service more popular than ever!

2010 was a very busy year for the faculty and graduate students involved in the Statistical Consulting Service (SCS). For the first time ever, the number of projects exceeded 200 (see figure below). As of December 1st, the number of clients in 2010 stood at 215 (a 20% increase over the next highest year). This has been particularly challenging because the level of graduate student and faculty support has been constant and the median amount of time one works with a client is 7 months. "It's wonderful to have our department so involved in research at Purdue. Also with budgets tight, it certainly helps to show growth in our service", said Bruce Craig (SCS director). "I've been very impressed with our student consultants. These are often quite challenging projects/analyses but we've been able to handle the increase because our consultants have learned to manage their time more efficiently. That is definitely a skill that will help them in their future endeavors."

Machine Learning Summer School at Purdue University
June 13-24, 2011

http://learning.stat.purdue.edu/mlss/mlss/start

Machine learning is a foundational discipline of the information sciences. It combines deep theory from areas as diverse as statistics, mathematics, engineering, and information technology with many practical and relevant real life applications. The aim of the summer school is to cover the entire spectrum from theory to practice. It is mainly targeted at research students, IT professionals, and academics from all over the world. This school is suitable for all levels, both for people without previous knowledge in machine learning, and those wishing to broaden their expertise in this area. It will allow the participants to get in touch with international experts in this field.

The summer school is organized by the Departments of Statistics and Computer Science with additional support from Discovery Park.

StatCom 2010

By Tim Clough, former StatCom Director

Statistics in the Community (StatCom) is a student-run consulting service in the Department of Statistics that provides free statistical consulting to governmental and nonprofit groups. Students who participate in StatCom work in teams on community projects, from which they are able to gain valuable statistical, analytical, and communication skills. Since its founding in 2001, StatCom has assisted over 50 clients, including local city governments, community organizations, and public schools. In the past two semesters, StatCom has worked on several projects, including the creation of a survey aimed at patrons of the Lafayette Symphony Orchestra. StatCom also analyzed the survey data and presented the results to members of the LSO Board of Directors.

StatCom is currently working on a project for an office of the local government. Members of this office contacted StatCom in August, requesting help for developing a predictive model for the sale prices of housing units throughout Tippecanoe County. A team of fourteen students, both undergraduate and graduate, is currently working on the project.

A recent collaboration with the Ronald McDonald House of Indianapolis is expected to bring several projects to StatCom. Ronald McDonald House provides accommodation for families of seriously ill or injured children hospitalized in the Indianapolis area. The first project will involve assistance with improving the group's waiting list process for potential house guests, and the creation of a data record and management utility for managing this list. Two other projects will involve the analysis of data collected from a guest exit survey and a volunteer satisfaction survey. StatCom is hopeful that these projects will recur on an annual or biannual basis.

For more information on StatCom, please visit http://www.stat.purdue.edu/external_relations/statcom/ and http://www.amstat.org/education/statcom/index.htm.

Congratulations Graduates!

August 2010: The Department of Statistics would like to congratulate all of our **August 2010** graduates. On August 7, 2010, Purdue University and the Department of Statistics awarded degrees to the following people:

Ph.D. Graduates - (Advisor) Dissertation Title

* **Paul Livermore Auer** - (Rebecca W. Doerge) "Statistical Design and Analysis of Next-Generation Sequencing Data". (Currently employed: Staff Scientist; Chris Carlson, Charles Kooperberg and Ulrike Peters Labs. Fred Hutchinson Cancer Research Center. Seattle, WA, USA).
* **Gayla Hobbs Olbricht** - (co-Advisors: Bruce Craig and Rebecca W. Doerge) "Incorporating Genome Annotation in the Statistical Analysis of Genomic and Epigenomic Tiling Array Data". (Currently employed: Visiting Assistant Professor; Department of Statistics, Purdue University. West Lafayette, IN, USA).
* **Andrea Rau** - (Rebecca W. Doerge) "Reverse Engineering Gene Networks Using Genomic Time-Course Data". (Currently employed: Postdoctoral Research Fellow; Gilles Celeux Lab. The French National Institute for Research in Computer Science and Control (INRIA) and University Paris-Sud 11. Orsay, France).

M.S. Graduates:

* Cindy Lui
* Melissa Yale

Graduate Certificates:

* Yunguang Chen
* Kyle Hernandez
* Junyan Ge
* Nathanael Yoder

Undergraduates in Statistics and Actuarial Sciences:

* Siliang Hu
* Priyanka Surana
* Jennifer Velikan
* Shun Yan Beanca Yu

August 2010 graduates: (front) Priyanka Surana, Gayla Olbricht (back) Paul L. Auer, Andrea Rau.

Congratulations Graduates!

December 2010: The Department of Statistics would like to congratulate all of our **December 2010** graduates. On December 19, 2010, Purdue University and the Department of Statistics awarded degrees to the following people:

Ph.D. Graduates - (Advisor) Dissertation Title

   * **Saptarshi Guha -** (William. S. Cleveland) "Computing Environment for the Statistical Analysis of Large and Complex Data"
   * **Andrew Lewandowski -** (Chuanhai Liu) "Population Monte Carlo Methods with Applications in Bayesian Statistics"
   * **Yanhui Mi -** (Chuanhai Liu) "Building Statistical Models for Financial Asset Returns: New Stochastic Volatility Model"
   * **Cheng Zhang -** (Olga Vitek) "Model-Based Indentification and Quantification of Metabolites in 1H NMR Spectra"
   * **Jianchun Zhang -** (Chuanhai Liu) "Statistical Inference with Weak Beliefs"

M.S. Graduates:

* Dallas Bateman
* Alia Clark
* Daniel Dillon
* Dung Du
* Qingling Jiao
* Yuequan Wan
* Yue Wang

Graduate Certificates:

* Inkyoung Hur
* Pei Chen Liu
* Pu-Tai Yang

Undergraduates in Statistics and Actuarial Sciences:

* Sally A. Diesslin
* Matthew Dunham
* Eric Faulkner
* Angela Hancock
* Matthew Hewitt
* Eric A. Hyland
* Eric P. Krafcheck
* Andrew Norris
* Daniel K. O'Toole
* Lauren A. Stehr
* Robert W. Urbanowicz
* Adriana Vars
* John P. Vizza
* Bo Wang
* How Jian Yoong
* Kicho Yu

Congratulations Graduates!

May 2011: The 213th Commencement of Purdue University was held the weekend of May 13-15, 2011. Twenty-six graduate students and fifty-five undergraduates received degrees from the Department of Statistics during the College of Science ceremony on May 14. Pictured below are celebrating students on the front steps of HAAS Hall prior to the ceremony. The department congratulates all of our gradautes, and we wish them luck in their future endeavors.

Ph.D. Graduates - (Advisor) Dissertation Title

* **Tilman Achberger** (Rebecca W. Doerge) "Selecting Subsets of Traits for Quantitative Trait Loci Analysis"

M.S. Graduates:

* Kyle Bemis
* Angelitta Britt
* Xun Cha
* Jung Won (Christina) Choi
* Meena Choi
* Weepoh Ee
* Qiming Huang
* Jinhak Kim
* Sara Laurentz
* Jianfu Li
* Xinyan Liu
* Christopher Miller
* Lichen Ni
* Sanvesh Srivastava
* Kean Ming Tan
* Daliana Vargas
* Kenneth Wakeland
* Yuequan Wan
* Catherine Withey
* Xu Wang
* Yue Wu
* Kan Yao
* Shuai Yu

Undergraduates in Statistics and Actuarial Sciences:

* Abdul Rahim Ab Ghani
* Liyana B. Abd Majid
* Nor Amirah B. Abd Rani
* Nornazira Abdul Aziz
* Evan W. Austin
* Kyle G. Baird
* Jared S. Bannister
* Darron W. Bennett
* Heather M. Bidock
* Michael C. Burkhart
* Ka Wang Chow
* Veronica A. Crofts
* Jeremy A. Cunningham
* Darren B. Doehrmann
* Erin M. Fogarty
* Grant M. Goedde
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* Yanyan Ma
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* Christopher N. Schillo
* Alexander M. Schneider
* Noah S. Sheeley
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* Imran Tuan Yaacob
* Jiayin Wang
* Yize Wang
* Michael S. Wleklinski
* Aidong Wong
* Jing Q. Xue
* Ka-Wai Yan
* Sheng Yang
* Ming Li Yeo

Save the Dates!

Join us for the
Purdue University Friends and Alumni Reception
at the 2011 Joint Statistical Meetings
in Miami Beach, Florida
Sunday, July 31 at 6:30 p.m. in the
Venus Room of the Loews Miami Beach Hotel
1601 Collins Avenue, Miami, Florida 33139
RSVP to Holly Graef at hgraef@purdue.edu
or (765) 494-6030 by July 15

Join us next year for the
Eighth Purdue International Symposium
on the Purdue West Lafayette campus
June 20-24, 2012

Please contact Diane Martin, assistant to the head,
at dlmartin@purdue.edu with questions about this very
exciting event! Stay tuned to www.stat.purdue.edu for
news and schedules for the symposium.

Thank you!

Greetings from Purdue!

I am thrilled to begin a new chapter in my professional life as the director of development for the Department of Statistics. I started with the department on May 5th and I am a Purdue alumna myself, having graduated in 1994 with a B.S. in consumer and family sciences. I look forward to visiting with the alumni who have been so dedicated to the department! I will see many of you on July 31st in Miami, Florida, at the Joint Statistical Meetings. Our Purdue reception will be from 6:30-8:30pm at the Venus Room of the Loews Miami Beach Hotel.

As you know, everyone is looking for ways to cut costs and Purdue is doing the same. We will receive less and less from the State of Indiana each year. Therefore, my most important role is to inform the friends and alumni of Statistics of the needs of the department. There are many gifting opportunities and I am here to help. There has never been a better time to make an impact in research, the life of a student or with general support just to name a few. I want to thank you for your loyalty, support and enthusiasm for Purdue Statistics—it is truly a place of pre-eminence!

We enjoy hearing your updates so please don't hesitate to share your news with us by going online to the "Send us your news/update your information link" found on the alumni page at www.stat.purdue.edu/people/alums. Please contact me with any questions or comments or if you need assistance regarding your philanthropy to Purdue Statistics.

All the best,

Julie Paolillo
Director of Development
(765)496-7502
jpaolill@purdue.edu

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Department of Statistics
Annual Fall Picnic 2010

Every year, the department has a fall picnic in honor of our incoming students. This year's picnic was held on September 25 in Ross Hills Park. The pot-luck food was wonderful and the company (students, faculty, staff, friends and family) was very lively. Raffle prizes were drawn after the meal and then the sporting activities commenced. Football, frisbee, and a cornhole tournament kept everyone entertained. Our first Annual Cornhole Tournament had thirty participants in several rounds of cornhole until the champions, Doug Crabill and Larry Smith, were crowned late in the afternoon.
Photo credits: My Truong (except where noted)

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