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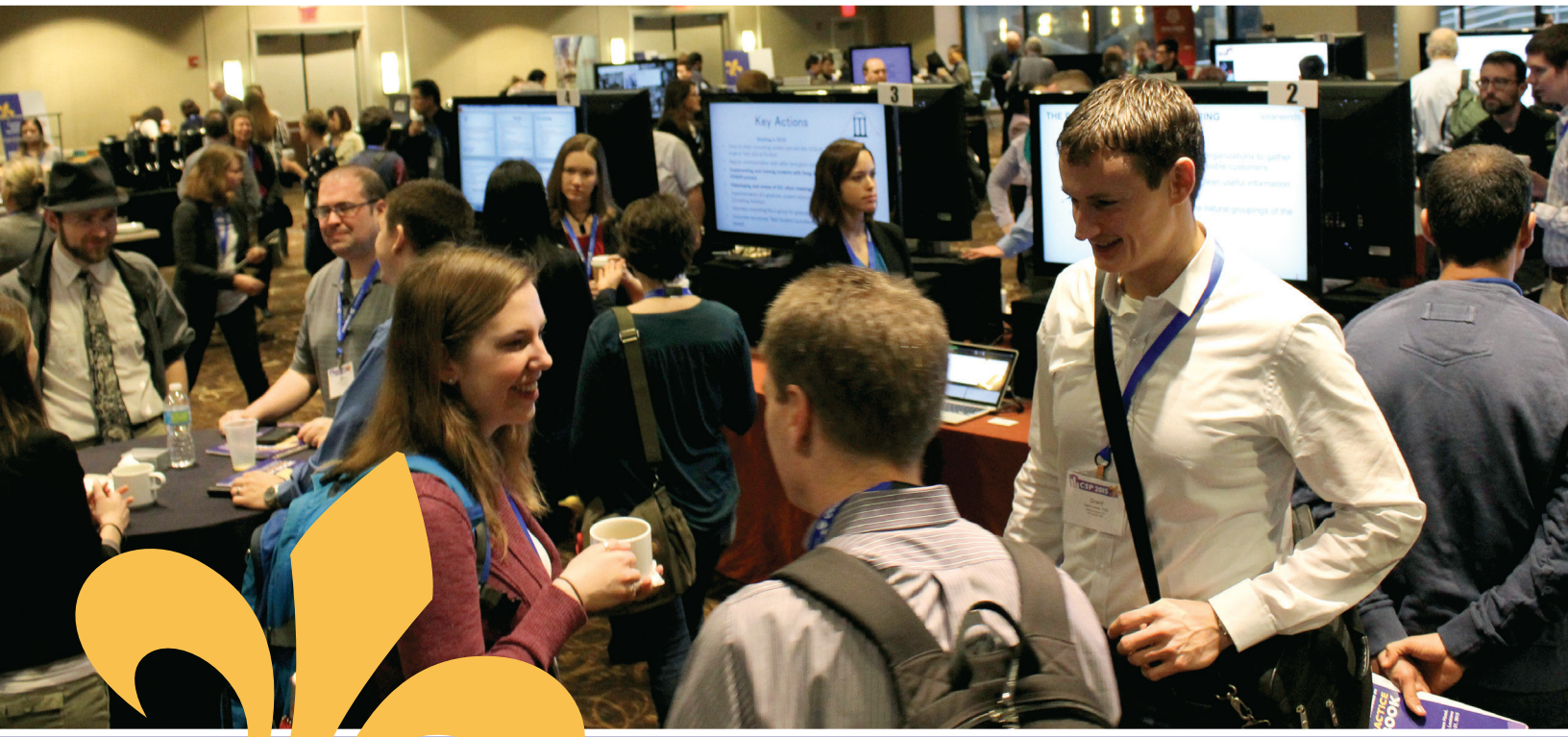

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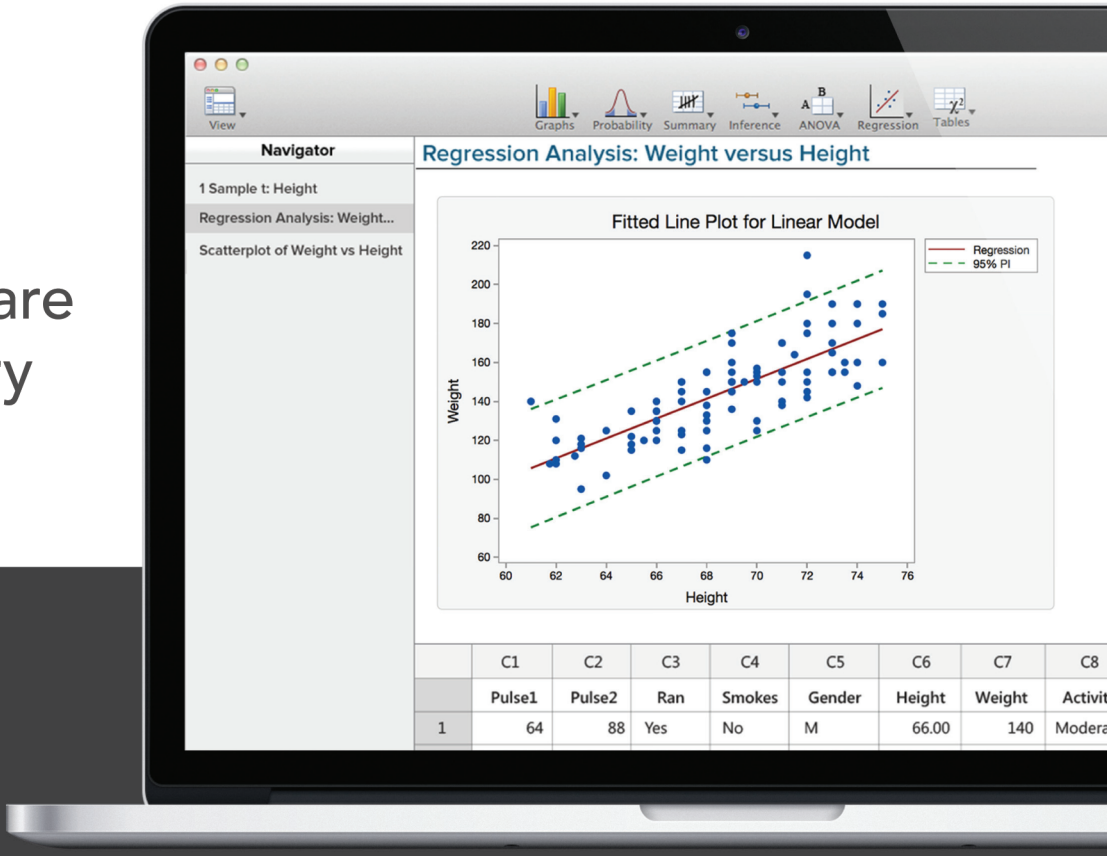

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The American Statistical Association is the world's largest community of statisticians. The ASA supports excellence in the development, application, and dissemination of statistical science through meetings, publications, membership services, education, accreditation, and advocacy. Our members serve in industry, government, and academia in more than 90 countries, advancing research and promoting sound statistical practice to inform public policy and improve human welfare.

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Steve Pierson earned his PhD in physics from the University of Minnesota. He spent eight years in the physics department of Worcester Polytechnic Institute before becoming head of government relations at the American Physical Society.

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This column is written to inform ASA members about what the ASA is doing to promote the inclusion of statistics in policymaking and the funding of statistics research. To suggest science policy topics for the ASA to address, contact ASA Director of Science Policy Steve Pierson at *pierson@amstat.org.*

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Should You Double Up?

STAT*tr@k* is a column in *Amstat News* and a website geared toward people who are in a statistics program, recently graduated from a statistics program, or recently entered the job world. To read more articles like this one, visit the website at *http://stattrak.amstat.org*. If you have suggestions for future articles, or would like to submit an article, please email Megan Murphy, *Amstat News* managing editor, at *megan@amstat.org*.

Online Articles

The following articles in this issue can be found online at *http://magazine.amstat.org*.

IN MEMORIAM Sadly, Martha S. Hearron, Jack Moshman, and Dorian Feldman passed away recently. To read these members' obituaries, visit *http://magazine.amstat.org*. To read about other ASA members in the news, visit our Statisticians in the News web page at *www.amstat.org/newsroom/statisticiansinthenews.cfm*.

Make the most of your ASA membership
Visit the ASA Members Only site: *www.amstat.org/membersonly*.

Visit the **ASA Calendar of Events,** an online database of statistical happenings across the globe. Announcements are accepted from educational and not-for-profit organizations. To view the complete list of statistics meetings and workshops, visit *www.amstat.org/dateline*.

Corrections

In the March issue, we stated posters for JSM were due April 1. That deadline is actually for the ASA/NCTM Joint Committee on Curriculum in Statistics and Probability and the ASA's Center for Statistics Education's Poster Competition and Project Competition. ***www.amstat.org/education/posterprojects***

Table 7 in March's salary survey article incorrectly showed the 0–2 median salary as 4,800. The correct median is $54,800. We have updated the table online: ***http://magazine.amstat.org/blog/2015/03/01/academic-salary-survey-whats-your-number/***

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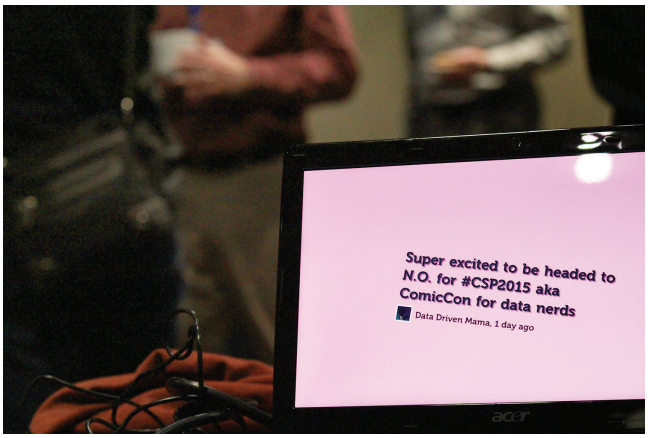

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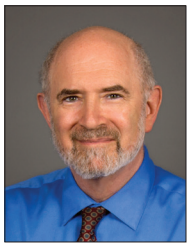
Conference on Statistical Practice: A Place for and About Communication



David Morganstein

Along with over 400 others, I attended the 4th annual Conference on Statistical Practice (CSP) in New Orleans in February (see the feature article on Page 34). Having attended all the CSPs, I can see how it is evolving and how well it serves elements of our membership. This time around, I was invited to give the keynote address, and I would like to share some of the ideas I presented.

First, here's a bit of history for those not familiar with the conference. The idea for the CSP came out of an initiative by former ASA president Sally Morton. She had the thought that there were other conferences that could both be of interest to members and possible revenue sources. She set up a working group chaired by Maura Stokes and Nat Schenker (who gave the keynote address at CSP last year). They developed the details, and the CSP organizing committee was formed to bring the idea to fruition.

The CSP is a small, more personal conference, held in a single hotel. It is easy for attendees to work out logistics and get from one session to another quickly. In the wrap-up sessions held at the end of last year's and this year's conferences, attendees expressed strong support for keeping the conference both small and personal.

Another important component of both this and last year's conferences was a mentoring program organized by Eric Vance. At both conferences, several dozen attendees—close to 10% of the participants—were paired and met each other by phone or email prior to coming to the conference. They were encouraged to meet at the opening mixer. This opportunity might well have increased their feeling of being an important part of the conference.

The CSP has the following four simultaneous tracks:

- Communication, Impact, and Career Development
- Data Modeling and Analysis
- Big Data Prediction and Analytics
- Software, Programming, and Graphics

The first of these tracks includes papers and short courses on personal skills development. Short courses in communication and leadership are an important addition to services the ASA provides, having been recognized as a valuable element in career development by ASA leadership (see "Career Success Training for Statisticians: A Progress Update," *http://bit.ly/1KWbqyI*). Effective communication and leadership skills are particularly important to statisticians in the early years of their careers as they are seeking opportunities to expand their role and the value they bring to their work.

My keynote address was titled "Communication: A Two-Way Street," and I chose it to emphasize the importance of the Communication, Impact, and Career Development track to our individual careers and the success of our profession. To do our work well, we need to receive—as well as transmit, listen, understand, and gather—data before we try to solve a problem and explain a proposed solution to our colleagues.

Well-thought-out, clear, bi-directional communications may be especially important in our profession given recent changes in our demographics. We have and are likely to continue to grow rapidly (see "Growing Numbers of Stats Degrees," *http://bit.ly/1oaXSou*). There is a notably large proportion of statisticians who are women, much more than any other STEM field (see "Women Flocking to Statistics, the Newly Hot, High-Tech Field of Data Science," *http://wapo.st/1v5EtlG*). Members of our association come from 90 countries, and one in nine of us resides outside the United States. For at least the past decade, more than 55% of statistics graduate students in the United States have been nonresident aliens, many of whom are learning and will be practicing their profession in a second language. We are a diverse, multicultural community. This environment presents communication challenges and, at the same time, offers opportunities to the ASA to serve our current members and welcome many new ones.

In the keynote presentation, I expressed a concern and used the story of the Tower of Babel as an

allegory. In addition to being so diverse culturally, the ASA is the Big Tent for Statistics and is welcoming to many special interests. This raises the potential for communication confusion. Each statistical specialty may use unique terms not understood by others within our profession or by those we want to communicate with, like journalists, who are outside our profession. We may even use the same term to mean very different things. For example, at the CSP, I attended a seminar about Big Data in which the presenter asked the attendees, "Do you know what 'scoring' means?" It turns out he meant using a model developed with training data to make an estimate from new data not included in the modeling step, not the likelihood score function I was familiar with. How can we avoid becoming a Tower of Babel?

Jargon can be a useful shorthand between those who understand its meaning. If we are trying to be understood by journalists and the public at large, however, our specialized terminology can become an impediment. For decades, we have written papers and articles meant for the public that include terms such as "type I errors" or "the size and power of a test." If you are not a student of statistics, the meaning of these terms may not be immediately obvious. A phrase such as "the error of over-reaction" or "the error is missed opportunity" might be much easier for nonstatisticians to learn and remember!

The importance of the two-way aspect of communication has been pointed out by many. Steven Covey's widely read *The 7 Habits of Highly Effective People* lists Habit #5 as "Seek first to understand, then be understood." He goes on to suggest that "communication is the most important skill in life."

In his book *Out of the Crisis*, W. Edwards Deming noted two points for management that are particularly relevant to our own profession: #8, "Drive out fear," and #9, "Break down barriers between departments." Both points address the importance of clear, open channels of communication between people working together to ensure accurate data are offered for use in making decisions.

In his 2000 Joint Statistical Meetings paper, former ASA president Richard Scheaffer wrote, "Good communications skills are important for prospective statisticians, in order to qualify for many positions in industry, where the need to explain technical matters to laymen is common." There are many good reasons to be aware of the quality of communication that is occurring—or not occurring!

We are surrounded by tools—both traditional and newer, high tech—we can use to make communication more effective … *if* we use them! Agendas, for example, can be sent before meetings to help attendees be prepared. Meeting minutes can be sent afterward to highlight decisions made and identify who will do what and by when. To help ensure reports include the most important topics in the right order, start with an outline agreed to by your co-authors or client. In this increasingly distributed workforce and teaching environment, collaboration tools are available at our fingertips to bring people from around the globe into a virtual meeting or classroom. Google Hangout is just one tool. Is there life after PowerPoint, better tools to convey ideas? Prezi, PreZentit, Haiku Deck, SlideDog, and SlideRocket are just a few presentation software options to consider. Prezi was used during the mentoring panel discussion at the CSP.

I'll conclude my comments about the CSP by introducing Emmanuel Thompson. We met in New Orleans through the ASA mentoring program. Emmanuel presented a poster session titled, "Economic Impact of Maternal Mortality in Africa: A Panel Data Approach." He completed his undergraduate work in statistics from the University of Cape Coast in Ghana and recently earned a PhD in statistics from the University of Calgary. He's now teaching statistics and probabilities at Southeast Missouri State University in a community he and his wife, Sandra, recently moved to. Emmanuel joined the mentoring program to make professional connections in our association since there are only a few statisticians in his math department. I send a special thanks to him and Sandra for dropping everything to volunteer their help to a group of us who were preparing materials for our early morning session the next day. It was a repetitive and routine task, but we all felt a sense of connection working together. My appreciation to both of you for the help, Emmanuel! ■

David Morganstein

ASA Participates in 5th Annual Climate Science Day on Capitol Hill

Steve Pierson, ASA Director of Science Policy

Four members of the ASA Advisory Committee for Climate Change Policy (ACCCP) went to Washington, DC, in early February to participate in the fifth annual Climate Science Day (CSD) on Capitol Hill. Sponsored and organized by the Climate Science Working Group—which is comprised of some 20 professional associations and other scientific organizations—the event brings scientists of many disciplines together to meet with members of Congress or their staff to discuss climate change and how it may affect a particular state or congressional district. The principal goals are for members or their staff to discuss climate science with scientists from their state with expertise on the topic and for them to contact the scientists should questions come up related to climate science.

Leonard Smith of the London School of Economics and Pembroke College, Oxford, who has participated in each of the five CSDs, noted how his experience this year was different than years past: "This year, we had Republican members openly discussing the challenges posed by climate change and suggesting common political ground could be found; that is a big change from previous years." He added, "On CSD in 2011, the House was still trying to get a budget together, making it difficult to have a conversation. This year, a member of Congress had to pop out of our meeting to vote on the Keystone XL pipeline and our next meeting was delayed as the member was returning from the same vote. This seemed to actually lead to a more relaxed discussion of the science and direct, well-targeted questions about climate from the member."

2013 CSD veteran Michael Stein of The University of Chicago, like Smith, also found a greater willingness among some Republican staffers to acknowledge that anthropogenic climate change is an issue Congress will need to address, and sooner rather than later. A highlight of Stein's visit was the opportunity to meet with Bill Foster, an Illinois representative and physicist who engaged in fairly detailed discussions about the storage challenges related to renewable energy.

The Ohio State University's Peter Craigmile—also a returning CSD participant—observed, "As in previous years, staffers on Capitol Hill were very interested in learning about local impacts of climate change, especially from extreme storms. We also had many discussions about the role that understanding climate has to play in energy policy."

Jim Elsner (Florida State University) and Leonard Smith (London School of Economics, right) discuss local climate issues with a Florida representative on the House Science, Space, and Technology Committee.

The fourth ASA participant was Bruno Sanso of the University of California, Santa Cruz, chair of the ACCCP and a first time CSD participant.

This year's CSD had 22 participants sponsored by the American Chemical Society; American Geophysical Union; American Meteorological Society; Ecological Society of America; and the agronomy, crops, and soil societies, among others. The 11 teams of scientists of different disciplines each had 6–10 meetings with personal offices and committee staff.

To prepare CSD participants for their day on the Hill, the participants spent the previous afternoon hearing from professional society staff and congressional Hill staff about how to have successful meetings on the Hill and about the objectives of CSD. They also were given time to meet with their teammates to plan for each of their scheduled meetings. Three of the ASA participants—all authors of the ASA whitepaper "Statistical Science: Contributions to the Administration's Research Priority on Climate Change" (*www.amstat.org/policy/pdfs/ClimateStatisticsApril2014.pdf*)—also met with program directors at the National Science Foundation to share the whitepaper, learn more about how to get statisticians involved in NSF-funded climate research, and make the case that such engagement would contribute to the science. ■

NSF Big Data Funding Opportunity for the Statistics Community

Michael Vogelius, Nandini Kannan, and Xiaoming Huo, NSF Division of Mathematical Sciences

EDITOR'S NOTE
Michael Vogelius is division director of the Division of Mathematical Sciences, and Xiaoming Huo and Nandini Kannan are program directors there.

The Big Data phenomenon has emerged as a result of the vast amounts of data becoming available across science, business, and government. Realizing the potential of Big Data will require fundamentally new techniques and technologies to handle the complexity, size, or rate of these data. Principled, innovative approaches are needed to address the challenges associat with the management, modeling, and analysis of such unprecedented amounts of data, including automation of aspects of the data-enabled disco ery processes; development of new computational, mathematical, and statistical methods for data analysis; and creation of novel visualization techniques for drawing insights from data.

The National Science Foundation just released a revised version of the solicitation "Critical Techniques and Technologies for Advancing Foundations and Applications of Big Data Science & Engineering (BIGDATA)." This crosscutting initiative includes participation of all the NSF directorates, including the Directorate of Mathematical and Physical Sciences (MPS). The list of cognizant program officers includes Xiaoming Huo and Nandini Kannan from the Division of Mathematical Sciences (DMS).

This solicitation should be of particular interest to the statistics community, with its emphasis on both fundamental theoretical and methodological issues related to Big Data and the development of tools and techniques for the analysis of Big Data from different application domains.

The BIGDATA program invites proposals in two categories:

Foundations (F): those that focus on the development of novel techniques, or novel theoretical analysis (including statistics and probability) or experimental evaluation of techniques, that are broadly applicable.

Innovative Applications (IA): those that focus on the development of innovative techniques, methodologies, and technologies for specific application areas or innovative adaptations of existing techniques, methodologies, and technologies to new application areas.

Potential research areas and challenges in Big Data may include the following:

- Reproducibility, replicability, and uncertainty quantification
- Data confidentiality, privacy, and security issues as they relate to Big Data
- Generating hypotheses, explanations, and models from data
- Prioritizing, testing, scoring, and validating hypotheses
- Interactive data visualization techniques
- Scalable machine learning, statistical inference, and data mining
- Eliciting causal relations from observations and experiments
- Addressing foundational mathematical and statistical principles at the core of the new BIGDATA technologies

The program page at *http://1.usa.gov/1wXLblz* provides a link to the solicitation, the list of program officers representing the different directorates, and a link to recent awards made through this program. Please read the solicitation for information about proposal preparation and submission, review criteria, and required supplementary documentation. The deadline for submission of BIGDATA proposals is May 20.

If you are interested in serving as a reviewer for proposals or would like additional information, contact Xiaoming Huo at *xhuo@nsf.gov* or Nandini Kannan at *nakannan@nsf.gov*. ■

ASA LEADERS REMINISCE

John Neter

In the fourth installment of the Amstat News *series of interviews with ASA presidents and executive directors, we feature a discussion with 1985 ASA President John Neter.*

Q You served as president of both the Decision Sciences Institute and American Statistical Association. How did you maintain a level of activity sufficient to become president of both professional societies?

A I have always felt my professional obligations as a university professor went beyond teaching, research, and service within the university and included service to organizations in my profession. Consequently, I was active in both the American Statistical Association and Decision Sciences Institute, the latter a relatively young organization at the time, with members primarily from the field of business administration.

Service as president in each organization required three years, one each as president-elect, president, and past president. Fortunately, my tours of duty were separated in time, with my presidency of the Decision Sciences Institute occurring from 1977–1980 and my ASA presidency some years later, from 1984–1986.

Q What led you and your coauthors to first write the books *Applied Linear Statistical Models* and *Applied Linear Regression Models*?

A To answer your question about my motivation for preparing the *Applied Linear Statistical Models* text, I need to go back to early in the 1950s, when Bill Wasserman and I were teaching statistics to business students at Syracuse University. None of the available elementary texts motivated the statistical methods with interesting applications from the area of business administration. Bill and I therefore decided to write our own introductory statistics text for business students that would employ interesting applications from business administration and economics to motivate students to appreciate the usefulness of the statistical methods presented. The result was *Fundamental Statistics for Business and Economics*, which was published in 1956.

By about 1970, after several editions of the elementary text, Bill and I decided to prepare a second-level statistics text for business and economics students. In addition to emphasizing applications in business and economics, we also wanted to unify the discussion of analysis of variance, covariance analysis, and regression. In most of the existing second-level texts, these topics were treated as separate subjects. Hence, students would not understand the common structure underlying these statistical methods. Furthermore, the discussion of multiple regression and covariance analysis tended to focus largely on computational methods. It was apparent to us by 1970 that computers would easily enable statisticians to carry out linear model calculations and an extensive study of hand computation for linear models would not be required as a result. Hence, our presentation would focus on the nature of the linear models and their uses and on diagnostic methods, rather than on the hand computations required to invert a matrix.

John Neter has been the C. Herman and Mary Virginia Terry Professor Emeritus of Management Sciences and Statistics at the Terry College, University of Georgia, since 1990. He taught there from 1975 until 1989. John previously taught at Syracuse University and the University of Minnesota. He earned his BS from the University of Buffalo, his MBA from the University of Pennsylvania, and his PhD from Columbia University.

John has served as president of the Decision Sciences Institute from 1978–1979; he served as president of the American Statistical Association in 1985. He was also chair of the Section on Statistics of the American Association for the Advancement of Science from 1991–1992. John has been named a Fellow of three professional societies: the American Statistical Association in 1965, the American Association for the Advancement of Science in 1965, and Decision Sciences Institute in 1980. He received the Distinguished Service Award of the Decision Sciences Institute in 1981 and the Founders Award of the American Statistical Association in 1990.

Throughout his long career, John's research interests have ranged from statistical sampling of accounting populations and response errors in sample surveys to statistical linear models. He is the co-author of *Applied Linear Statistical Models, Applied Linear Regression Models, Applied Statistics*, several monographs, and numerous journal articles.

COMING UP
Please return to this column next month, when we will feature an interview with 1990 ASA President Vince Barabba.

As we began preparing materials for the second-level text in the early 1970s, it became clear that we could not adequately cover the range of topics we intended and also include ample illustrations of applications in business and economics without the book becoming much too long. As we realized a major reduction in the scope of the second-level book was required, we were quickly led to linear models as the primary focus of the book. The first edition of *Applied Linear Statistical Models* appeared in 1974. While preparing a second edition, the publisher decided to also present only the regression material in a separate book; this was published as *Applied Linear Regression Models* in 1983.

Q In what volunteer roles had you served the ASA prior to being elected ASA president?

A I served in many capacities prior to my election as ASA president. My very first service was in 1958 as president of the Twin Cities Chapter. And in 1962, when the National Statistical Meetings were held in Minneapolis, I chaired the local arrangements committee. In 1966, I headed the program committee for the National Statistical Meetings.

I also served on a number of committees of the American Statistical Association and two terms on the ASA Council. I was elected to the ASA Board of Directors for two terms, from 1974–1980, and served as editor of *The Americans Statistician* from 1976–1980.

Q What were the main issues that the American Statistical Association faced during your term as president?

A A key issue that faced us during my three-year term as ASA president-elect, president, and past president was acquiring our own office building. This was a major effort, involving site acquisition, building plans, fundraising, rental of unneeded space, and financing. The ASA had rented office space in downtown Washington as far back as I can remember, and the organization was quickly outgrowing this space. Also, we wanted the office to be located more conveniently for the many members from out of town who were attending the numerous meetings held each year at the ASA office. Ralph Bradley led the fundraising effort in the early 1980s and was very successful. Management had identified a suitable site and building in Alexandria and recommended proceeding with the purchase. I chaired a building acquisition committee and we examined the feasibility of proceeding. Unfortunately, we concluded that this was not the time to proceed. The real estate market in the Washington area was quite weak at the time, so we could not be assured of being able to rent the extra office space at a sufficient rental rate to break even; our financial condition did not permit us to risk operating losses. Fortunately, a few years later, we were able to proceed at a different site in Alexandria.

Another issue we faced at the time I was involved in the ASA leadership was the need to attract and retain applied statisticians. We considered, in particular, our publication policy and the annual meeting format to make the association more attractive to applied statisticians.

Still another issue was long-range planning. Historically, the American Statistical Association had not engaged in long-range planning. I asked Don Marquardt, president-elect, to undertake the ASA's first long-range planning effort, which he carried out in most effective fashion. We were also very much concerned with encouraging the teaching of statistics in public schools and promoting greater and better use of statistics and statisticians by the sciences.

Reminiscing About Bob Hogg

Jim Cochran

Last fall, Bob Hogg, who served as ASA president in 1988, was working with me on an interview for the ASA Leaders Reminisce series. Sadly, on December 23, 2014, Bob passed away in Highlands Ranch, Colorado.

Even at 90, Bob's responses to my email about this initiative were sharp and insightful, and his story would have been of great interest to the readers of *Amstat News*.

I had met Bob briefly several times; the first time was in 1995 at the fist JSM I attended. I was on an elevator in either the Swan or Dolphin Hotel (the 1995 conference was held at these Disney World hotels). Bob boarded the elevator and I immediately and inarticulately told him how much I enjoyed studying from the book *Introduction to Mathematical Statistics* that he had written with Allen Craig. Bob looked at me, quickly surmised I was a very green graduate student, and immediately dove into a conversation with me. When the elevator door opened at my floor, I certainly was not ready for this brief conversation to end. Without hesitation, Bob got off the elevator with me. We talked for about 15 minutes—mostly about *my* research and *my* career aspirations—and then he got back on the elevator to go to his floor.

Bob was smart, funny, generous, and personable—and he was passionate about statistics. He was also a highly decorated statistician; the many awards he received include the Mathematical Association of America Award for Distinguished Teaching, ASA Fellow, the ASA Founder's Award, and the Regent's Award for Faculty Excellence. The statistics community benefitted greatly from Bob's contributions. We will miss him.

Q Your textbooks have been important resources in applied linear models courses for many years. What are the most important trends in statistics education you have seen develop during your career? What are your thoughts about the current state of the discipline?

A In my professional career, which ended 25 years ago, I was always interested in decision making based on good data. My interest was not only in the statistical methods used to aid decision making, but also in the relevant data needed for making good decisions—hence my interest in sample surveys and formally designed statistical experiments.

Thus, I have been delighted to see in recent years the increasing emphasis on data-driven decision making and the availability of large databases.

I am also pleased that the popular media are paying increased attention to the field of statistics and the contributions made by statisticians. By coincidence, the current issue of *The Economist* contains an interesting article about the impact of World War II on the field of statistics in Britain, and, in turn, the effect of statisticians on the war effort.

As in the days when I was active in the field of statistics, I note that statisticians today continue to be challenged to work with other disciplines so the full benefits of statistical methodology can be achieved. ■

Writing Workshop Planned for Junior Researchers

The National Institute of Statistical Science (NISS), American Statistical Association (ASA), and Institute of Mathematical Statistics (IMS) will hold a writing workshop for junior researchers (subject to availability of funds) August 9 and 12 at JSM in Seattle.

The goal of the workshop is to provide instruction for writing journal articles and grant proposals. Participants will be required to provide a recent sample of their writing, which will be reviewed by a senior mentor. The sample could be a current draft of an article to be submitted for publication, or it could be an early version of a grant proposal. (Submission of the will be required as part of the registration process. Prior experience suggests that the best results come from submitting an early draft of something written solely or primarily by the participant.)

The mentors will be former journal editors and program officers, who will critique (a portion of) the submitted material. Individual feedback will be provided as part of the opening session, and participants will be expected to prepare a revision in response. The workshop will open with a one-day session of general instruction in effective writing techniques. It will continue with a half-day session for participants whose native language is not English and close with discussion and debriefing at a follow-up lunch.

At the close of the formal activities on August 9, mentors will meet individually with participants to go over the writing samples they submitted. Each participant will then prepare a revision of a critiqued portion of the paper and return it to the mentor by the evening of August 11.

Mentors and participants will meet again in conjunction with a lunch on August 12 to discuss the success of the revisions. The lunch program also will include general feedback to participants, mentors, and organizers.

The half-day session for non-native English speakers will be held on the morning of August 12 and include a continental breakfast.

Attendance will be limited and depend on the number of mentors available. To apply, go to *www.amstat.org/meetings/wwjr/registration*. Applications are due by June 1; successful applicants will be notified by June 30. Applications received after June 1 will be considered if space is available. There is no fee for participation, but participants must agree to attend the full August 9 session, half-day August 12 session, and the August 12 lunch. We have requested funding for partial travel support.

This workshop is designed for researchers with a recent PhD in either statistics or biostatistics. Top priority will go to those who have held the PhD for 0–3 years. Current PhD students who are completing their degree before the end of the summer and who will be at U.S. institutions in the fall also will be considered. If space is available, researchers at institutions outside the United States will be admitted. ■

Quantity, Quality, and Statistics Without Borders

Justin Fisher, Statistics Without Borders Past Chair

According to *The Third Plate* by Dan Barber, child rearing begins "not at birth, or even conception, but 100 years before a child is born" in Mennonite tradition. It's been a few months since I became past chair of Statistics Without Borders (SWB), and, upon reflection, it strikes me that the ASA really should have thought about SWB in about 1908. No matter. To create the environment necessary for SWB to thrive 100 years *from now*, we should consider two things: quantity and quality.

Before we tackle these questions about the future, let's look a little at our short history. SWB was created in 2008 to provide pro bono statistical assistance to organizations worldwide. We are still a young upstart, and in our first half dozen years, we found our footing by sipping from the fire hose of endless options and opportunities. We did our best to evaluate requests for our help, as well as welcoming hundreds upon hundreds of eager volunteers.

At first, this was done purely in an ad hoc way. But, we have since put in place systems to ensure consistency, and more will be coming "online" soon. Although the rules need some further codification, we on the executive committee have largely come to agree on what makes for an appropriate SWB project. We also have begun to track with a simple spreadsheet the current status of all accepted projects. We are now more consistent and rooted in documentation, which has become increasingly necessary as the number of projects has grown.

So what's next for ensuring a sustainable organization? We have been talking about how best to scale up, and many ideas have been floated. Of course, our goal is to help more and more organizations. In addition, there have been numerous suggestions about how to recruit more volunteers. My view is that we already have many potential volunteers. As of JSM 2014, we had more than 1,000 people on our listserv, and for every call for a volunteer, we routinely receive a dozen people raising their hands. The supply-demand ratio is out of balance. Part of our current limitation on the number of projects is that all the administrative staff of SWB are also volunteers—executive committee members and project managers alike. So an increase in projects would require more administrative volunteers to establish relationships with organizations, track projects, and carry out other nonstatistical (but incredibly important) tasks.

It's also worth asking how large of an organization we want to be. The most famous "Without Borders," Médecins Sans Frontières, has an annual budget of $400 million and a network of 24 associations. Granted, they had a 40-year head start on SWB, but we should think about whether we aspire to a similar size and scope. For now, however, we have no paid staff and aren't even set up to take donations (a dilemma for an entirely separate article).

It is not simply a matter of scaling up administratively. In the past few years, we've also tried to address systematically the quality of our assistance, and SWB leadership has increasingly made this a priority. The latest on this front is that SWB put out a call in February for volunteers to be on a quality assurance committee. I am confident this will be a good start to ensuring we adhere to our standards. Not only that, but it should free up time for members of the executive committee to pay attention to other issues, such as organizing more projects.

To me, it comes down to both quantity and quality. We shouldn't emphasize one without keeping careful watch on the other. My hope is that slow and steady growth, with an emphasis on putting systems in place, will lead to a more efficient and sustainable organization—able to provide more assistance—in the coming years. I look forward to seeing you all at JSM 2115 to take stock once again. ■

Be a JSM DOCENT

If you have attended three or more JSMs, consider becoming a 2015 JSM docent by following these five easy steps:

1. Make plans to attend JSM 2015.
2. Be willing to answer questions and help first-timers have a positive JSM experience.
3. Attend an orientation session on Sunday, August 9, and a thank you reception on Wednesday, August 12.
4. Attend JSM events and invite first-timers to join you.
5. Send your contact information to *JSMDocent@amstat.org* to receive more information.

STAFF SPOTLIGHT

Amanda Malloy

Howdy! I am thrilled to be at the ASA and serving as the director of development. I have been here since last August and have spent the past several months building a development program for the ASA that will allow the organization to continue to build upon the important work in support of the practice and profession of statistics.

Amanda Malloy rides her Dutch Warmblood during a dressage competition in Leesburg, Virginia.

I am a proud Texan (Do we come any other way?), but have lived in three foreign countries and a few other states along the way. In 2004, I graduated from Texas A&M University with a degree in biomedical science and married my husband, who is also a Texas Aggie and serves as a major in the U.S. Air Force.

Our first assignment took us to Ramstein, Germany, for four wonderful years. It is in Germany that I discovered my passion for working with nonprofit organizations. Before coming to the ASA, I spent eight years with the USO, working in several areas of development. I really enjoyed it and found it rewarding to grow relationships with corporate partners and individual donors.

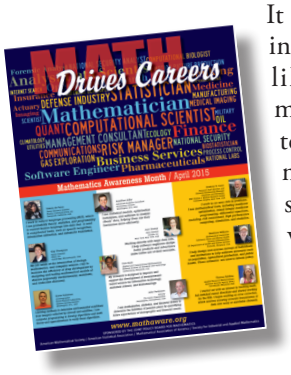
I have a deep appreciation for good food and wine and love to travel. My biggest hobby (literally) is riding my Dutch Warmblood. I grew up riding bareback, chasing cows on my family's ranch in North Texas, and then graduated to galloping across open fields and jumping over various obstacles. Now, I have settled down into riding in dressage competitions.

My husband and I have a 3-year-old son, Drew, who is absolutely the light of our lives. He provides constant entertainment and exercise for us!

I have thoroughly enjoyed being at the ASA and getting to know many of you already. I'm looking forward to meeting many more of you in the near future! ■

April Is Mathematics Awareness Month

This year's theme is 'Mathematics Drives Careers'



Innovation is an increasingly important factor in the growth of world economies. It is especially important in key economic sectors like manufacturing, materials, energy, biotechnology, health care, networks, and professional and business services. The advances in and applications of the mathematical sciences have become drivers of innovation as new systems and methodologies have become more complex. As mathematics drives innovation, it also drives careers.

Students are an obvious group interested in opportunities for meaningful and challenging careers. To increase awareness of the opportunities for careers using mathematics, the Joint Policy Board for Mathematics (JPBM) sent two copies of this year's Mathematics Awareness Month poster to nearly 4,000 individuals in daily contact with college students in STEM majors.

Each year, JPBM sponsors Mathematics Awareness Month to recognize the importance of mathematics through written materials and an accompanying poster that highlight mathematical developments and applications in a particular area.

Interested persons and institutions can find additional information, theme essays, and a sample press release that can be adapted for local public awareness activities and efforts on the Mathematics Awareness Month website at *www.mathaware.org*. Also, follow Math Awareness Month on Twitter @MathAware or on Facebook and keep up with the latest STEM career profiles.

To order the 2015 Mathematics Awareness Month poster, call SIAM Customer Service at (215) 382-9800; fax your request to (215) 386-7999; or mail your request with check or payment information to Joanne Cassetti, Society for Industrial and Applied Mathematics, 3600 Market St., 6th Floor, Philadelphia, PA 19104. Include your name, shipping address, and credit card number (Visa or MasterCard) and expiration date. All orders must be prepaid.

Pricing for posters is as follows: $2.00 for the first; $5.00 for 2–5; $9.00 for 6–10; and $13.00 for 11–15. Call SIAM for pricing on 15 or more posters.

The JPBM is a collaborative effort of the American Mathematical Society, American Statistical Association, Mathematical Association of America, and Society for Industrial and Applied Mathematics. ■

Significance, Royal Statistical Society Offer Writing Competition

Open to those within first 10 years of career

Jeff Meyers, ASA Public Relations Coordinator

Each year, *Significance* and the Young Statisticians Section of the Royal Statistical Society host a competition to promote and encourage top-class writing about statistics. Entrants must be students or graduates within the first 10 years of their statistics careers. The deadline for this year's competition is May 30.

Send *Significance* magazine an article of 1,500–2,500 words on the subject of your choosing. The article could be on work that you have done, or it could explain the work of others. The winning article will be published in the October 2015 issue of *Significance* and on *significancemagazine.com*. Runners-up also will be published online.

Entrants should follow these basic guidelines:

- The article should be interesting, engaging, and easy to read.
- Technical terms and mathematics should be kept to a minimum and explained clearly when used.
- Readers will finish the article knowing more about statistics than they did before.

Three finalists will be invited to present their work at a special session of the Royal Statistical Society International Conference (September 7–10, Exeter, UK), where the winner will be announced.

Last year's winner, Jonathan Auerbach, used public data and a variation on capture-recapture methodology to counter the myth that New York City is home to as many rats as people. Following publication of his prize-winning article, write-ups of his work appeared in *The Wall Street Journal*, *New York Times*, *Daily Mail*, *Newsweek*, *China Daily*, and *Japan Times*.

Of our two runners-up, Nathan Cunningham used Google search data to investigate the claim that Christmas comes earlier each year, while Katie Saunders compared survey data to medical records to check whether patient ethnicity is recorded correctly. Cunningham's analysis was reported widely in the UK and Ireland, including on the front page of the *Daily Telegraph*, while Saunders' research was covered by *The Guardian*.

Email submissions in a text/Word file or as a PDF to *ysswritingcompetition2015@gmail.com*. To read the complete rules, visit *Significance* online at *www.statslife.org.uk/significance/2019*. ■

Jonathan Auerbach won in 2014 with his paper, "Does New York City Really Have as Many Rats as People?"

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Q&A with Largest, Fastest-Growing Undergraduate Statistics Departments

MORE ONLINE
Go to *www.amstat.org/misc/StatsBachelors2003-2013.pdf* for the complete list of 130 universities that have granted bachelor's degrees in statistics.

Statistics is the fastest-growing STEM major for the period 2010–2013. With a 95% increase in degrees granted from 2010 to 2013, it outpaced computer/information technology and administration and management environmental/environmental health engineering.

In the February issue of *Amstat News*, heads of four of the largest and fastest-growing departments responded to five questions. This month, we hear from five more departments about their growth.

Table 1—Five of the Largest and Fastest-Growing Undergraduate U.S. Statistics Programs

Statistics Bachelor's Degrees	2011	2012	2013	2011–2013	2011–2013 total relative to 2003–2005 total
University of California, Berkeley	88	99	143	330	224%
Purdue University	77	100	135	312	875%
University of Illinois, Urbana-Champaign	30	52	67	149	452%
University of California, Davis	32	55	53	140	233%
University of Florida	30	29	32	91	250%

University of California, Berkeley

Ani Adhikari is chair of the undergraduate and MA program committees of the department of statistics at the University of California, Berkeley. She developed and taught the department's first MOOC and is part of Berkeley's new campus-wide data science education initiative.

What do you believe is driving the growth in the number of statistics majors in your department? What are you doing (if anything) to recruit majors? How much longer do you expect such growth?

The main reason for the increase in our statistics majors is that many industries and academic disciplines now recognize they have a flood of data and need to be able to work with it sensibly. This has led to the practical consequence that students with skills in data analysis are highly sought after as employees. However, it has also led to a broad realization that statistics is an area filled with exciting intellectual challenges for students with quantitative skills, either in pure mathematics or in computing. Thus, we are seeing an increase in students who want to enter the field not only because they think it will help them get a job, but also because they have simply become interested in statistics.

Many of our statistics faculty members have joint appointments in other departments, so it is no surprise that more than half of our students are double majors. Most of them come to us through their interest in statistical applications in their other major, which could be any one of a varied list: computer science, economics, applied mathematics, and molecular biology, to name just a few.

Berkeley's statistics department has always had a close connection with the department of mathematics through the lively and energetic probability group. In recent years, several Fields Medals have been awarded to mathematicians with an interest in probability theory. This has led to an increased number of mathematics majors becoming interested in probability and subsequently adding statistics as a major.

We have not needed to do much to recruit majors, apart from participating in university-sponsored events such as Cal Day, an annual open house for the entire Berkeley campus.

The need for good data analysts is not going to disappear, though the details of exactly how data are analyzed might change. Thus, we expect the growth to continue for a few years. It's also worth noting that our internal data show even larger degrees numbers than the NCES data in the table: 2011: 100; 2012: 151; and 2013: 167.

What kinds of careers or graduate programs are your graduates moving on to? Who are the top recruiters?

Approximately 10% to 20% of our undergraduates go directly to graduate school. MA and PhD programs in statistics are typical destinations, though graduate programs in other disciplines are also common among our double majors. These disciplines include physics, electrical engineering, biomedical engineering, artificial intelligence and robotics, and MD/PhD programs.

Berkeley statistics undergraduates who go directly to industry are typically employed in sectors such as IT, banking and finance, insurance, and human resource consulting. Companies that hire our graduates range from small start-ups to giants like Google, Oracle, PricewaterhouseCoopers, Liberty Mutual, and Citigroup.

How have you changed your curriculum to adapt to the data science era, and how will you use the *ASA Curriculum Guidelines for Undergraduate Programs in Statistical Science*? Have you considered starting a professional MA program?

Though our students acquire a substantial knowledge of theory in all our courses, the upper division electives are almost all centered on data analysis. The department's undergraduate course in statistical learning theory is a popular choice of elective, as is the undergraduate seminar course in reproducible and collaborative data science, developed within the past two years. Along with the department of computer science, the department of statistics is spearheading Berkeley's new data science education initiative, from a freshman-level data science course to a new data science major program.

Our undergraduate major program is well aligned with the ASA guidelines. The core consists of probability theory, statistical methods and theory, and data manipulation and computation; these are among the fundamental skills listed in the guidelines. In addition, students take several electives, most of which include project-based work designed to develop skills in statistical practice and communication. Finally, all students are required to take a "cluster" of courses in an area of application to develop domain-specific knowledge necessary for appropriate applications of statistics in that area.

Three years ago, we launched a one-year professional MA program for full-time students, replacing our former two-year program for half-time students. As a result, the number of MA students admitted to our department each year has risen from about five to about 40. The MA program has its own team of advisers, and the students receive career guidance from the department's industrial alliance program. Graduates of the program are now employed in a variety of sectors, including IT, finance, insurance, and marketing, as well as in government departments such as public health.

How have you managed the growth in the number of majors? Has the university allocated more resources (e.g., finances, space, personnel) to your department?

We have recently introduced more stringent entry requirements for the statistics undergraduate major to try to control the numbers. However, classes and waiting lists continue to be at capacity, with statistics majors and students in other disciplines clamoring for enrollment. To meet this demand while maintaining an excellent quality and variety of courses, the department must regularly request increased undergraduate teaching resources from the university. This includes the appointment of several teaching faculty, as well as ladder-rank research faculty, to replace recent retirees and still further increase the number of FTEs.

The new professional MA program has led to a significant increase in the number of graduate students, as well. We are increasing the number administrative staff and rearranging responsibilities so both the undergraduate and graduate programs are managed efficiently.

Large numbers of students can lead to programs becoming impersonal or intimidating. To maintain the department's sense of community in spite of growing enrollments, we have been attentive to our students' physical environment. Labs have been refurbished to easily accommodate group work, as well as traditional classroom formats. Undergraduates have their own common room, as do the MA students.

What recommendations do you have for students considering a major in statistics? Any advice for students already committed to a major in statistics?

Get started early. You will be studying statistics, mathematics, and computing, as well as acquiring expertise in an area of application.

Mathematics and computing are essential tools for data analysis. Become proficient at using both, and really good in at least one.

Don't limit yourself. Acquire as broad a range of skills as possible, both classical and modern.

Communicate. You should expect to work in multidisciplinary teams with people whose backgrounds are quite different from yours.

Learn how to learn. The field is evolving rapidly, and you must be able to pick up new ideas and techniques by yourself after you graduate.

Purdue University

Rebecca Doerge is the Trent and Judith Anderson Distinguished Professor and head of statistics at Purdue University. Her research program is focused on statistical bioinformatics, a component of bioinformatics that brings together many scientific disciplines to ask, answer, and disseminate biologically interesting information in the quest to understand the ultimate function of DNA and epigenomic associations.

What do you believe is driving the growth in the number of statistics majors in your department? What are you doing (if anything) to recruit majors? How much longer do you expect such growth?

The department of statistics at Purdue University has approximately 400 undergraduates at any given time. We are at capacity with respect to size due to our course/section seat limit (40 students per section). With respect to recruiting, many of our undergraduate majors transfer into statistics from other majors (engineering, computer science, etc.) after taking a course and liking it. Others are double and triple majors with actuarial science, computer science, mathematics, biology. A popular dual degree is actuarial science (an equally shared and administered degree-granting program from the department of mathematics and the department of statistics).

Most importantly, we have an active chair of the undergraduate program, Mark Ward, who goes out of his way to meet with students and their parents to talk about options and future employment opportunities. Further, Ward recently received a Living-Learning Community grant from the National Science Foundation to recruit and retain statistics undergraduate majors. This grant recruits 20 students a year in each of five years and is expected to be instrumental in moving Purdue statistics undergraduate education to a new level.

Finally, many of the faculty at Purdue statistics work with undergraduates on research projects, and often give undergraduate seminars to expose undergraduate students to the many areas of statistics.

As far as how long we expect the growth in statistics majors to last, no one really knows. If we look to the future, I doubt very much there will be a slowdown in data generation, organization, or asking questions of these data using statistics. I predict that the folks collecting data and asking the questions will realize the power of experimental design coupled with statistical analysis and computing and that the growth we are experiencing in educating the future generation of statisticians will continue.

What kinds of careers or graduate programs are your graduates moving on to? Who are the top recruiters?

The majority of sole actuarial science majors who graduate are hired by insurance companies (State Farm, Allstate, etc.). Those students who are sole statistics majors (or multiple degree majors) typically go to graduate school in computer science, economics, epidemiology, biostatistics, statistics, or computational finance. For those statistics majors who join the workforce, employers are a broad range of companies that need SAS programmers, data analysts, critical thinking, and/or consultants.

How have you changed your curriculum to adapt to the data science era, and how will you use the *ASA Curriculum Guidelines for Undergraduate Programs in Statistical Science*? Have you considered starting a professional MA program?

We have developed a modern experimental design course for undergraduate majors, and we have a new Big Data course. Further, we are discussing requiring a programming language (C, Python, Java, etc.), but are challenged by the credit requirements of the university. Finally, we are adapting our courses to include team projects, communication skills (written and spoken), and presentation skills.

With respect to starting a professional master's program in statistics, Purdue statistics has, and historically has had, an extraordinary applied statistics master's program that is considered a professional degree by the university.

How have you managed the growth in the number of majors? Has the university allocated more resources (e.g., finances, space, personnel) to your department?

Yes, this is a challenge, especially with our undergraduate program(s). All of our required courses for undergraduate statistics majors are taught by PhDs,

with the exception of one lecturer who has a PhD in statistics. This means our undergraduate statistics majors are taught by tenure-track faculty. Given that our courses are full, we are in a position to limit the number of majors. For example, we have around 400 undergraduate majors, and this is maximum capacity given our faculty number.

Interestingly, even though we are limiting growth of our undergraduate program in statistics, we are experiencing enrollment pressure from non-majors (e.g., engineering) who are required to take statistics courses as part of their core curriculum. If there are no seats for non-major required statistics classes, the graduation rates are negatively affected, and this has negative ramifications on the university rankings. It is due to the enrollment pressure from non-majors that we have experienced a growth in faculty (e.g., six faculty; 5.25 FTE hired for the 2014–2105 academic year).

Finally, because of the consistent growth in our faculty (professors and lecturers) numbers and graduate program, we have significant space issues. The majority of our lecturers share offices, and our graduate offices are at maximum capacity. We do borrow space from other departments, which is a problem when they need their space back to house their own people. The upper administration is unsympathetic to our needs.

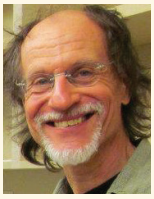
What recommendations do you have for students considering a major in statistics? Any advice for students already committed to a major in statistics?

The best advice I have for people considering a major in statistics is "*do it.*" Another piece of advice is to consider co-majoring with a compatible degree that makes you unique to the job market, or uniquely qualified for specific graduate programs. For example, statistics and biology are compatible for computational biology or bioinformatics. Economics and statistics are terrific for finance. Computer science and statistics are fantastic for Big Data and/or data analytics.

My advice for current majors in statistics is to take as much computing as possible. Gain skills in handling Big Data (e.g., manipulating data, pulling data, transferring data, and exploring data graphically). Take care to not become dependent on software packages for analyses (i.e., learn a real programming language). Take an algorithms course and make the connections between computing, machine learning, and statistics.

University of California, Davis

Hans-Georg Müller is professor and chair of the department of statistics at the University of California, Davis. He is a fellow of the ASA, Institute of Mathematical Statistics, and American Association for the Advancement of Science and an elected member of the International Statistical Institute.



Müller

Aue

Alexander Aue is associate professor and vice chair for undergraduate affairs in the department. He is a member of the ASA, Institute of Mathematical Statistics, and Econometric Society.

What do you believe is driving the growth in the number of statistics majors in your department? What are you doing (if anything) to recruit majors? How much longer do you expect such growth?

The majority of our students enter the statistics program either by being admitted with a different major and then switching to statistics after taking one of our introductory statistics courses or by adding statistics as a second major. UC Davis has a significant number of students who are double majoring in statistics and economics and statistics and mathematics. Due to the Data Science Initiative on campus and the current rise of the theme of Big Data, we might experience additional growth in CS/stats double majors in the future.

The growth in the number of majors is driven by two larger trends. The first is jobs. Students with quantitative, data-analytic, and statistical skills tend to get higher-paying jobs. This has been highlighted repeatedly in the mainstream media and students are aware of it. The second is that many disciplines on campus are becoming more data oriented and students see the need to acquire statistical tools to succeed in their field of study.

We do not actively recruit majors into the program, but we participate in campus-wide events such as Decision Day for students admitted to UC Davis, where we have partnered with mathematics

"Students with quantitative, data-analytic, and statistical skills tend to get higher-paying jobs. This has been highlighted repeatedly in the mainstream media and students are aware of it."

in the past two years to give TED-style talks about our major to interested students.

Since 2011, we have more than tripled our undergraduate student population. The number of majors topped 200 for the first time in the spring of 2014 and just recently exceeded 300. We expect growth to continue for a while, albeit at a less steep rate, as the underlying trends that drive it continue to play out. As long as our graduates continue to find well-paying jobs in industry and are admitted to top graduate programs, statistics will be an attractive major.

How have you managed the growth in the number of majors? Has the university allocated more resources (e.g., finances, space, personnel) to your department?

The growth in the number of majors was initially not met by allocation of more resources. On the contrary, due to budget shortfalls at the state and university levels, the number of ladder-rank faculty in our department has decreased by more than 25% during the time period in which the number of majors has tripled. The administrative decision not to fill FTEs vacated through departures and retirements added strain for both staff and faculty advisers—and increased workload for all faculty and instructors.

Currently, we have 14.25 faculty who serve 300 majors and 150 graduate students (PhD and MS combined and including the biostatistics graduate program housed in our department). This is in addition to a large number of students who take introductory statistics in service courses. These service courses have been mostly taught by ladder-rank faculty, but we are now in the process of hiring lecturers whose main task will be the teaching of these courses. Faculty workload also has increased due to the recent start up of a revenue-generating MS program that enrolls about 50–70 students per year.

More recently, we have managed to communicate the urgency of faculty hires to the administration, and there are concerted efforts underway with support from the dean and higher university administration to increase personnel at all levels. We are recruiting several tenure-track faculty, visiting assistant professors, lecturers, and postdocs through the NSF-funded Research Training Group that we have in the department.

The dramatic increase in the number of students taking both our major-required and service classes has led to a significant increase in class sizes across the board. In the near future, we aim to cap major-required classes at a maximum of 80 students and service classes at 120 students. We are basing our requests for additional faculty positions on a target size for upper-division classes of 60. We have occasionally also experienced problems with classroom quality and availability.

What kinds of careers or graduate programs are your graduates moving on to? Who are the top recruiters?

Our graduates have gone on to a variety of careers. More than one-third enter graduate school, for example, in statistics, economics, or finance. The remaining graduates find jobs in industry or government. With the proximity to Silicon Valley, some of our graduates work for companies such as Google, Facebook, Apple, and smaller start-ups. With the California state government located in close-by Sacramento, students also have found work at one of the many state agencies. Other careers include jobs as actuaries and, more recently, health services. Finally, a small fraction of our students pursue careers in teaching.

University of Illinois at Urbana-Champaign


Simpson


Unger


Glosemeyer

Douglas Simpson is professor and chair of the department of statistics at the University of Illinois at Urbana-Champaign.

David Unger is an instructor and undergraduate program adviser in the department.

Darren Glosemeyer is an instructor and professional development adviser.

What do you believe is driving the growth in the number of statistics majors in your department? What are you doing (if anything) to recruit majors? How much longer do you expect such growth?

At our university, we have seen a dramatic rise in the number of newly admitted freshmen declaring statistics as their major on the application, so it is clear high-school students are becoming more aware of the field. The growth of AP Statistics and K–12 statistical education is surely a factor, as is the recent media coverage of data science opportunities in the job market. Much of our recent growth, however, has been due to an increase in the number of students transferring into the major, declaring the statistics minor, and declaring statistics as a second major. Part of this may be driven by their exposure to our courses and part by the increasing need for students in many other fields to understand statistical ideas and to perform proper analyses of their data.

As a department, we made the undergraduate major a priority more than a decade ago, introducing a new first-year survey of statistical methods and data analysis and developing further course opportunities at the undergraduate level. We also are increasing our efforts to reach out to newly admitted freshman early through email and advising. There appears to still be considerable room for growth in the major, if we are able to continue to expand the department to meet the large demand we are seeing.

What kinds of careers or graduate programs are your graduates moving on to? Who are the top recruiters?

In recent graduating classes, roughly 45% of students for whom we know outcomes went directly into a graduate program. The programs were predominantly statistics master's programs. Bachelor's graduates also have gone on to PhD programs in statistics, applied math, computer science, and economics, as well as JD programs. In addition to statistics MS and MA programs, students have entered accounting, financial math, data science, public health, computer science, public administration, and agriculture and applied economics master's programs.

Graduates often take analyst positions with major companies in insurance, finance, market research, consumer products, engineering, and manufacturing. Typical roles include business intelligence, analyst, and data science positions at major corporations; actuarial, risk analysis, and financial positions at insurance and financial institutions; analyst positions in market research; and some software engineering positions. Insurance, finance, and market research continue to be strong recruiters of our undergraduates. Consumer products and manufacturing have shown increasing interest, as have tech companies interested in data scientists. Many of our students who enter industry consider the possibility of pursuing, or are already planning to pursue, a graduate degree after gaining some industry experience.

How have you changed your curriculum to adapt to the data science era, and how will you use the *ASA Curriculum Guidelines for Undergraduate Programs in Statistical Science*? Have you considered starting a professional MA program?

Several years ago, we developed new analytics courses emphasizing data management and statistical analysis of databases. More recently, we have developed several new courses with greater computational and data science components, including a course emphasizing Big Data methods, and a new statistical programming course at the undergraduate level. We have a sizeable professional master's degree program in statistics and analytics, with more than 60 MS graduates per year in the last two years. The ASA development of guidelines for undergraduate programs is great for helping us plan for the future of the field.

How have you managed the growth in the number of majors? Has the university allocated more resources (e.g., finances, space, personnel) to your department?

The dramatic growth of the undergraduate statistics major, the development of a large high-quality MS program, and the overall increase in our teaching for the university have created a solid foundation for growth of the faculty and PhD program. In recent years, we have been able to grow both the tenure-track faculty and the specialized teaching faculty (lecturers and instructors), and we see room for further growth in the faculty to help with the large demand for statistics instruction. Further, we have expanded our PhD program in response to both the opportunities for PhD students and the increasing need for teaching assistant support of our courses. As we managed this growth, it was critical to bring in new instructors with student advising as part of their portfolio. Students benefit greatly from experienced advisers to help them navigate through the curriculum and focus their career plans for the future.

What recommendations do you have for students considering a major in statistics? Any advice for students already committed to a major in statistics?

Statistics is a great major for quantitatively oriented college students, giving them a solid foundation for many possible career paths, whether they plan on graduate studies going straight to the job market upon graduation.

Our advisers highly encourage students to take our statistical survey course early and simultaneously focus on their calculus and linear algebra skills in their first two years. Once they take a mathematical statistics course, they begin to see the intersection of theoretical and applied topics.

For more advanced majors, we encourage them to explore a variety of our advanced-level electives building their mathematical, computational, and analytical repertoire. Further, they are encouraged to pursue internships or undergraduate research in unfamiliar areas when possible.

The University of Illinois Research Park offers many opportunities for students to gain industry experience doing internships with the companies that have research facilities in the park. Statistical methods and skills are highly transferrable, so we recommend students focus on honing their own abilities so their talents can shine in any number of environments.

University of Florida

Brett Presnell has served as chair of the department of statistics at the University of Florida since August 2012. His research interests include nonparametric methods, directional data analysis, and model selection and testing.

What do you believe is driving the growth in the number of statistics majors in your department? What are you doing (if anything) to recruit majors? How much longer do you expect such growth?

Not too many years ago, statistics was almost entirely a "found major" for undergraduates at the University of Florida: Students took a statistics course or two to fulfill a requirement in some other program, developed an interest in the area, and decided either to change their major to statistics or to add it as a second major. This has changed in recent years with the growth of AP Statistics in high schools and the positive publicity the field has received in connection with analytics and Big Data: The number of statistics majors has grown steadily; a larger proportion of our undergraduate majors now enter the university as declared statistics majors; and, while the number of students pursuing statistics as a second major also has grown, such students constitute a smaller proportion of our majors than they did prior to 2006.

This growth has occurred in spite of our department not actively recruiting undergraduate students to the major. Some of the growth we experienced in the late 2000s could be attributed to the personal efforts of Ron Randles, who was popular among our undergraduates as both a teacher and undergraduate coordinator. However, the major has continued to grow rapidly since his retirement in 2012, and we expect this growth to continue and even accelerate for the foreseeable future.

What kinds of careers or graduate programs are your graduates moving on to? Who are the top recruiters?

Unfortunately, our university does not seem to collect data of this sort, or if they do, it is not made

available to the departments. As a department, we have begun to survey our graduating students informally, but the response is voluntary and the data so far are limited. The data we have collected, along with a fair amount of anecdotal data, suggest many of our undergraduate majors continue on to graduate and professional studies in statistics and other fields. These students are able to gain admission to good programs and universities, and a background in statistics is seen as a competitive advantage, even for those applying to programs in other areas.

Students who choose to enter the job market upon graduation find positions in a variety of industries. Our department also offers a minor in actuarial science, which has grown rapidly in recent years. Many statistics majors also complete the actuarial minor; those students seem to do well in the job market and command relatively high salaries.

How have you changed your curriculum to adapt to the data science era, and how will you use the *ASA Curriculum Guidelines for Undergraduate Programs in Statistical Science?* Have you considered starting a professional MA program?

Because of faculty losses incurred during the Great Recession, we have not made any changes to our undergraduate program in recent years and we are not currently considering a professional MA program. We hope to add substantially to our faculty in the near future, and we will look to modernize our curriculum as we do. The ASA's original guidelines served as a template for our major as it was formed, and we will refer to the new guidelines as we move to update our offerings and requirements. Our survey data show that nearly all of our undergraduate majors feel the need for a dedicated course in statistical computing, and I expect we will look first to increase the depth and breadth of our coverage in that area.

How have you managed the growth in the number of majors? Has the university allocated more resources (e.g., finances, space, personnel) to your department?

We certainly have not seen any new resources as of yet; indeed, as mentioned previously, our overall faculty numbers are down. Last year, we were able to add a full-time lecturer to our ranks, and we have been fortunate to have two retired faculty in the area who serve as adjunct instructors on a course-by-course basis.

The university's budget has begun to turn around in the last couple of years, and we are in the process of adding to our tenure-track ranks. George Michailidis just joined the University of Florida as a member of our department and founding director of the university's Informatics Institute, a campus-wide initiative. We expect to continue rebuilding our faculty, with some of that hiring coming in connection with the Informatics Institute. As we do, we will be able to devote more effort and resources to all our academic programs, including the undergraduate major in statistics.

What recommendations do you have for students considering a major in statistics? Any advice for students already committed to a major in statistics?

I don't think your readers will find my answers to these questions very surprising. One of the best predictors of success in any STEM field is success in calculus, and certainly students who do well in calculus and linear algebra seem to have an easier time in our major. So, at great risk of confusing correlation with causality, I would encourage prospective statistics majors to take those courses seriously. Students who intend to pursue graduate studies in statistics would also be well advised to take as many "hard" math courses as they can manage, including a rigorous course in real analysis.

Most students of statistics also would be well served to gain a solid foundation in computer programming, both through coursework and self-instruction. It helps to have a project in mind to focus one's programming efforts, and fortunately for statistics students, there is no end to fun projects to be generated by scraping and combining data from the web for further analysis.

It's also a good idea to develop a substantial interest in a particular field of application, perhaps by pursuing a minor or a second major. These days, there are very few areas in which statistics does not play a role, so finding something you enjoy should not be difficult.

Finally, learn to write and speak well, and take every opportunity to practice and improve in these areas. Your ability to communicate effectively will set you apart from the crowd and increase your enjoyment of your work and studies. ■

SCIENCE POLICY

FY16 Budget Requests Position NIH, NSF, and Federal Statistical Agencies Well for Congressional Deliberations

Steve Pierson, ASA Director of Science Policy

President Obama's proposed budget for fiscal year 2016 (FY16) contains healthy increases for the NIH, NSF, and many federal statistical agencies. However, realizing the proposed increases will be a challenge with sequestration levels back in place. (The Bipartisan Budget Act of 2013 suspended sequestration for FY14 and FY15.)

The ASA urges its members and the broader statistical community to contact their senators and representative to support increases for the agencies you most rely on.

MORE ONLINE
President Obama's Precision Medicine Initiative was rolled out on January 30. Read more here: *http://magazine.amstat.org/blog/2015/04/01/fy16-budget*

NIH and NSF

The FY16 request for NIH is $31.3 billion, an increase of $1 billion (3.3 %) over the FY15 budget. Of the requested increase, $200 million is for the president's new Precision Medicine Initiative (PMI) and another $70 million is for his BRAIN Initiative, which would bring its total funding to $135 million. If fully funded, NIH officials estimate it could fund 1,200 more research grants than it can in FY15, raising its proposal success rate from an estimated 17.2% in FY15 to 19.3%.

Of the $200 million proposed for NIH's portion of the PMI, $70 million would—according to the White House PMI fact sheet—go to the National Cancer Institute to "scale up efforts to identify genomic drivers in cancer and apply that knowledge in the development of more effective approaches to cancer treatment." $130 million is for the "development of a voluntary national research cohort of a million or more volunteers to propel our understanding of health and disease and set the foundation for a new way of doing research through engaged participants and open, responsible data sharing." The NIH documents characterize the cancer component of the PMI as nearer-term goal and the broader applications to health and disease as a longer-term goal.

According to Francis Collins's FY16 request slides, the $70 million in additional BRAIN Initiative funding in FY16 at NIH would be used to develop innovative technologies to advance basic neuroscience and new, noninvasive tools for human brain imaging; generate methods for classifying the brain's diverse cells/circuits; and improve technologies for recording and modulating groups of cells that act together in circuits.

For Big Data to Knowledge (BD2K), the request proposed an increase of $19.5 million to $63 million. (The FY15 proposed level was for $88 million.)

The $380 million (5.2%) increase for NSF would raise its budget to $7.7 billion, in part to support the following four cross-foundation initiatives:

- Understanding the Brain ($144 million)
- Risk and Resilience ($58 million)
- Innovations at the Nexus of Food, Energy, and Water Systems ($75 million)
- Inclusion Across the Nation of Communities of Learners that have been Underrepresented for Diversity in Engineering and Science ($15 million)

The request also supports funding for the following ongoing NSF-wide priorities:

- Clean Energy
- Cyber-Enabled Materials, Manufacturing, and Smart Systems (CEMMSS)
- Cyberinfrastructure Framework for 21st-Century Science, Engineering, and Education (CIF21)
- Innovation Corps (I-Corps)
- NSF Research Traineeship (NRT)
- Research at the Interface of Biological, Mathematical, and Physical Sciences (BioMaPS)
- Science, Engineering, and Education for Sustainability (SEES)
- Secure and Trustworthy Cyberspace (SaTC)

Of the $380 million proposed increase, nearly $100 million is for the Education and Human Resources (EHR) Directorate, which would amount

to an 11% increase for the directorate. $253 million is the requested increase for NSF's research and related activities, which would be a 4% increase. It is worth noting that the FY15 request similarly favored EHR, but Congress did not approve. For the NSF Division of Mathematical Sciences, the FY16 request is for $235.5 million, $3.74 million (1%) above FY15.

Federal Statistical Agencies

The proposed increases for the federal statistical agencies are generally ambitious, signaling the strong support of the administration for federal statistical data.

The requested increase for the Bureau of Economic Analysis (BEA) is $14 million (14%), which includes $5 million for the move of BEA from downtown Washington, DC, to the headquarters of the U.S. Census Bureau in Suitland, Maryland. The remaining part of the increase is for three initiatives to better understand small businesses, energy components of our economy, and trade services.

The requested increase for the Bureau of Justice Statistics (BJS) is $20.4 million (50%), a large portion of which is to provide subnational estimates from the National Crime Victimization Survey.

The Energy Information Administration (EIA) has requested an increase of $14 million (12%) and proposed five new initiatives.

The National Center for Education Statistics (NCES) has a requested increase of $42 million (18%) to conduct numerous surveys.

The National Center for Science and Engineering Statistics (NCSES) would see a $3.6 million increase (6.3%) for numerous projects. Similarly, the National Agricultural Statistics Service (NASS) would see a $7.6 million (4.4%) increase and the Internal Revenue Service Statistics of Income Division (SOI) would see a $1.8 million (5%) increase.

The National Center for Health Statistics (NCHS) requested $5 million to improve its vital statistics program. The NCHS request also seeks an additional $12 million from the Prevention and Public Health Fund for additional content and/or sample increases for the National Health Interview Survey and National Ambulatory Medical Care Survey.

The increase for the U.S. Census Bureau is especially large, $412 million (38%), because of its ramping up of its 2020 decennial census work and what they are calling a re-engineered census, which, according to Department of Commerce Congressional Justification, "includes sweeping design changes, including new methodologies to conduct in-field address canvassing, innovative ways of optimizing self-response, the use of administrative records to reduce the nonresponse follow-up workload, and the use of technology to replace tasks previously accomplished manually."

Table 1— FY16 Budget Requests for NIH, NSF, and 13 Primary Federal Statistical Agencies

	FY13	FY14	FY15	FY16 Request	FY16 Change from FY15
Research Agency (in millions of dollars)					
NIH	29300	30070	30311	31300	3.3%
NSF	6884	7172	7344	7724	5.2%
Statistical Agency (in millions of dollars)					
BEA	89.8	95.0	96.3	110.0	14.2%
BJS	41.3	45.0	41.0	61.4	49.8%
BLS	577.2	592.2	592.2	632.7	6.8%
BTS	26.0	26.0	26.0	29.0	11.5%
Census	841.7	945.0	1088.0	1500.0	37.9%
EIA	99.5	117.0	117.0	131.0	12.0%
ERS*	71.4*	78.1*	85.4	86.0	0.7%
NASS*	166.0*	161.2*	172.4	180.0	4.4%
NCES	226.0	235.0	232.0	274.4	18.3%
NCHS*	138.7*	140.0*	155.4	160.4	3.2%
NCSES	41.6	47.1	58.3	62.0	6.3%
ORES	27.5	29.0	30.0	27.0	-10.0%
SOI	33.1	35.0	36.2	38.0	5.0%

*ERS, NASS, and NCHS went through accounting changes last year, so the FY15 levels aren't comparable with the FY13 and FY14 levels.

The Bureau of Labor Statistics (BLS) would see a $41 million increase (6.8%), which includes $25 million to improve the Job Openings and Labor Turnover Survey and $10 million to restore funding for the International Price Program export price indexes.

The request for the Bureau of Transportation Statistics (BTS) is a $3 million (11%) increase to conduct the intercity passenger travel survey and vehicle inventory and use survey.

The Economic Research Service (ERS) and Social Security Administration Office of Research, Evaluation, and Statistics (ORES) fare the worst in the FY16 request, with the former getting a 1% and the latter a 10% cut.

Details on the FY16 requests can be found in the ASA Community blog entry at *http://bit.ly/1xcSrEs*, where one also can find links to the analyses from the Consortium of Social Science Associations and Council of Professional Associations on Federal Statistics. ■

STAT*tr@k*

Should You Double Up?

7 grads weigh in on whether their double major paid off

You like statistics, but your passion is history. Should you double major? We asked several ASA members how they did it and why. We also asked if it was worth the work. Here are their responses:

WENXIAO GU

Undergraduate Majors: Statistics and Mathematics
Undergraduate Degrees: University of Minnesota, 2012
Current Position: Business analyst of statistical modeling at Amazon Web Service

Why did you choose to double major? How/why did you choose your combination of majors?

I was thinking to get a PhD in statistics/machine learning. I found a lot of math in those graduate programs, thus I thought getting a BS degree in both math and statistics would be beneficial.

What are you doing now? Are you using both majors? If so, how?

I am a business analyst on the Amazon AWS marketing team. I use many statistical models, but rarely use complex math theories (differential equations, geometry, etc.). Math is the foundation of all quantitative sciences. I would suggest undergraduates learn applied math/stats—operational research, optimization, regression, linear algebra—instead of real analysis, for business majors.

What are some of the skills for which you are seeing the most demand—statistical or otherwise?

SQL is definitely one must-have skill for statisticians. Communication is important when your audience does not understand complex statistical theories.

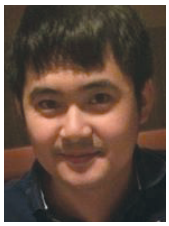
Anything you'd do differently with your undergraduate program if you could go back in time?

I would get a double degree in math and computer science. Most stat courses, I mean applied ones, can be picked up easily for somebody who has a math background. Also, if you know programming, you'd definitely make a difference with a product of stats models. Nowadays, many statistician or data scientist positions require knowledge in C++, Java, or Python. Software like SPSS, SAS, and R can't easily deal with large data sets, so statistical computing is getting more important.

On the other hand, statistics and finance/marketing/sales would be a hot combination. Since the big data era has begun, more and more business decisions are based on data and statistics, therefore is useful in many business concepts.

What advice do you have for undergraduates considering a statistics degree on whether to also pursue a second major?

Maybe some students want an advanced degree in statistics. In this case, more math is better. But please don't ignore the growth of computer science. Database knowledge, optimization algorithms, and concepts of cloud computing will finally be part of statistical science one day, if the complexity of data gets "crazier." In general, I love the combination of math and statistics when pursuing a BS degree.



Gu

Robertson

MEGAN ROBERTSON

Undergraduate Majors:
Statistics and Mathematics and History
Undergraduate Degrees:
Amherst College, 2015

Why did you choose to double major?

I initially chose to be a mathematics and history major because these are two fields that interested me. By studying mathematics, I found another interest in statistics, so when Amherst College added the major as an option for the 2014–2015 academic year, I knew it was something I wanted to pursue. I chose my majors because they were different areas that I wanted to study, but as I near completion of my studies, I recognize that each taught me things useful to the other majors. My background in mathematics has been very helpful in my statistics studies, as it has strengthened my quantitative and proof-writing skills. My history major has helped me improve the writing and communication skills I use to explain the results and interpretation of statistical tests, and my statistics major has caused me to think more critically about the data presented in my history classes.

What do you plan to do after you graduate?

After I graduate, I am planning to pursue a master's degree in statistics. After finishing a graduate degree, I want to work as a data scientist or statistical consultant. I do not know what field I want to pursue a career in, but I am excited to explore the different possibilities.

What advice do you have for undergraduates considering a statistics degree on whether to also pursue a second major?

I definitely encourage undergraduate students to pursue a statistics degree if they are interested in the discipline. I have thoroughly enjoyed my studies, and I am looking forward to learning more at the graduate level. Statistics provides you with the tools necessary to understand and interpret data. If you are interested in another field, it is likely you will be able to apply your knowledge of statistics to [that field]. Data are everywhere and can be found in many disciplines: economics, biology, psychology, etc. If you find yourself passionate about two areas of study, pursue both because you will be able to use statistics to gain a deeper understanding of the other.

Lyubchich

VYACHESLAV LYUBCHICH

Undergraduate Majors:
Statistics and Economics
Undergraduate Degrees:
Orenburg State University of Agriculture, Russia, 2008
Current Position: Research Assistant Professor, Chesapeake Biological Laboratory, University of Maryland Center for Environmental Science

Why did you choose to double major?

When I was entering university, the strengthening businesses, new government policies, and overall economic growth of post-Soviet Russia were providing a high demand for economists. I expected my second major in economics would just help me find a better job, but it gave me much more than that. Someone said bilingual people live two lives. I would add that a second major granted me a new dimension to live in, an extra perspective for the things around me.

What are you doing now? Are you using both majors? If so, how?

I am teaching statistics and conducting research at the University of Maryland Center for Environmental Science. I employ economics here as well, since models from my post-doctoral projects on insurance claims dynamics and customer attrition in banks can be applied to environmental data sets.

Anything you'd do differently with your undergraduate program if you could go back in time?

I would take more computer science courses to study effective programming in different languages and take some time to diversify my knowledge through learning web design or a foreign language.

What advice do you have for undergraduates considering a statistics degree on whether to also pursue a second major?

Pursuing a second major is like acquiring an extra sense: You do not just see the statistics of a stock market, you smell that particular stocks will go up soon; you do not just see a simulated output, you taste different scenarios and hold the computer program under your control. Just ask yourself what problem you'd like to tackle with the statistical tools and adjust your perception to this multidimensional world.

Kronenberg

MARK KRONENBERG

Undergraduate Majors:
Math and Economics
Undergraduate Degrees:
Vanderbilt University, 1991
Current Position: Founder, MATH 1-2-3

Why did you choose to double major?

Originally, I majored in electrical engineering, but my real strength is math, not science. I entered EE because so many people recommended it because I was good in math. But math talent is a necessary but not sufficient condition to be good at engineering. I learned in hindsight not to choose a major just because someone suggested it. I changed to a math and economics double major because both fields interested me and because they are complementary fields. My decision was a good one, because it helped me distinguish myself from others. There are a ton of math majors and a ton of economics majors, but few math/economics double majors. When I chose the double major, I did so solely out of my own interests. However, in retrospect, I think having a double major might have helped me get my first job as an actuary.

What are you doing now? Are you using both majors? If so, how?

After working in the actuarial field for a short while, I founded MATH 1-2-3 (*www.math123.com*). We specialize in private home math tutoring. In business, it's important to have a USP (unique selling proposition). Almost every tutoring company tries to be everything to everyone … much like a disingenuous politician. Choosing a specialty sets my company apart from the jack-of-all-trades/master-of-none companies.

Since I've had my company for 20 years, I'm looking for new challenges, so I'm finishing my MS in applied statistics and decision making at the Fordham Graduate School of Business. This term, I'm conducting a statistical arbitrage independent study that involves testing automated trading strategies. I will be using Excel, R, and Python.

Having a math major with a strong statistics component helped me pass early actuarial exams and also helped in my tutoring business. Having an economics degree with a strong finance component helped me in my recent MS coursework in a portfolio management course. Having a strong statistics undergraduate background is helping me with my current applied statistics coursework. Having an economics background will also help me enter the finance field.

What are some of the skills for which you are seeing the most demand—statistical or otherwise?

I have seen many job listings requesting candidates with knowledge of SAS, R, and Matlab (similar to R). Math and statistics backgrounds are frequently requested. Writing ability is important in many jobs. For example, you may be asked to explain results from a statistical experiment in layman's terms.

Anything you'd do differently with your undergraduate program if you could go back in time?

Computer skills are very important in finance, so I wish I had started learning programming sooner. R and Python are used a lot in finance, and I've seen many job listings requesting those who are proficient in C++, etc. If I could go back in time, I would add computer science as a third major, even if it meant I had to graduate 1–2 years later. I would learn as many programming languages as possible.

What advice do you have for undergraduates considering a statistics degree on whether to also pursue a second major?

Choose a field that interests you and is complementary to statistics. I realize it's easier said than done to know when you're 18 years old what field you want to pursue, but research fields that interest you. Meet people in your prospective fields to see if they are right for you. Having a second or third major will distinguish you from others, and that's important in the job market. I'm sure it would also help in graduate school admissions.

Baggaley

JOHN BAGGALEY

Undergraduate Majors: Statistics and Economics
Undergraduate Degrees: Statistics 2005, Economics 2012, University of Utah
Current Position: Data Analyst, Neustar

Why did you choose to double major?

I chose to get my second major to open up more employment possibilities. Economics was a good fit with statistics as a complementary discipline.

What are you doing now? Are you using both majors? If so, how?

I am a data analyst at Neustar. I use information from both of my majors every day in my work. I was specifically added to my team because of my statistical knowledge.

What are some of the skills for which you are seeing the most demand—statistical or otherwise?

In my job (and others I applied for) we use SQL a lot. Also used are Hive, Hadoop, regular expressions, R, Tableau, and Python.

Anything you'd do differently with your undergraduate program if you could go back in time?

I would have taken more classes that focused on the computer skills needed in the workforce.

What advice do you have for undergraduates considering a statistics degree on whether to also pursue a second major?

Having a second major is crucial for entering the workforce. The second major opens extra doors and shows a more well-rounded applicant. It is a certain advantage in getting interviews and opportunities.

Venkatraman

SARA VENKATRAMAN

Undergraduate Majors: Statistics and Computer Science
Undergraduate Degrees: Cornell University, 2017

Why did you choose to double major? How/why did you choose your combination of majors?

I chose to double major because I think statistics and computer science complement each other well. I am especially interested in topics at the intersection of the two fields, such as machine learning and data mining. I enjoy learning about algorithms and programming languages that facilitate statistical analysis just as much as I enjoy learning about the use of probability models and stochastic systems in subfields of computer science such as artificial intelligence.

What advice do you have for undergraduates considering a statistics degree? If they were to choose statistics as a major, what advice do you have on whether to also pursue a second major?

Statistics is a wonderful subject to study because students have the chance to learn about powerful mathematical methods, but also about making practical sense of data, identifying patterns, conducting interesting studies, and communicating results well, all of which are useful skills. It is a also a great subject to pursue a second major with, because statistics is applicable to so many other fields and can make the study of another subject much more interesting. For students majoring in another subject but interested in conducting any kind of academic research or data analysis, I would highly recommend some coursework in statistics.

What do you plan to do after you graduate?

I would like to go to graduate school and hopefully earn a PhD in either statistics or computer science. I am most interested in pursuing a career in academic research, but I am open to other possibilities, including data science, medical research, finance, and engineering. For example, I will be interning as a software engineer at Microsoft this summer, which I think will be great exposure to engineering professions.


deVries Photography

Woodwyk

"There are no drawbacks to a second major. The education is worth the extra time, and I think it helps set students apart and shows a great work ethic."

ALYSSA WOODWYK

Undergraduate Majors:
Statistics and Biomedical Sciences
Undergraduate Degrees:
Grand Valley State University, 2014
Current Position: Biostatistics Intern

Why did you choose to double major?

I added statistics as a second major after deciding that medical school was not the route I wanted to take. I knew I was good with numbers and was thrilled when I found out how applicable statistics is to medicine. After discussing with my statistics major adviser, I was so excited to get a master's degree in biostatistics because it allows me to combine both passions for medicine and statistics into one. At the time, I considered dropping my major in biomedical sciences, but I only needed to take two more classes to complete it.

Adding the second major in statistics meant spending five years on my bachelor's degree, but it was definitely worth it. The knowledge I gained has helped me excel at my internship, where I spend my time providing statistical assistance to medical professionals. I also considered only getting a minor in statistics, but once I started taking more statistics courses, I knew this was what I wanted a career in. So, I decided to maximize my time at Grand Valley and complete the double major.

What are you doing now? Are you using both majors? If so, how?

I am currently finishing my master's of science in biostatistics. I am using both majors at my internship, where I assist medical professionals with the statistical aspects of their research. My major in biomedical sciences has given me the background knowledge necessary to communicate successfully with various medical professionals. My major in statistics created the foundation necessary to succeed in my master's program and provided statistical assistance in the research setting.

What are some of the skills for which you are seeing the most demand?

I see demand for skills in SAS, R, and SQL quite a bit. Also, working in both teams and independently has come up a lot, as well as communicating statistical results in layman's terms.

Anything you'd do differently with your undergraduate program if you could go back in time?

Looking back, I wish I had recognized my passion for statistics sooner. I still would have gotten a double major in biomedical sciences and statistics because I do have a passion for health care and hope to get a job where I can merge both passions into one and change medicine through analytics. I never regret spending that fifth year completing my second major in statistics. I am proud of what I have accomplished and feel beyond prepared to be successful in a position as a biostatistician.

What advice do you have for undergraduates considering a statistics degree on whether to also pursue a second major?

Statistics has endless applications. A second major is beneficial and allows one to become more knowledgeable in whatever area they would like to apply their statistical expertise. There are no drawbacks to a second major. The education is worth the extra time, and I think it helps set students apart and shows a great work ethic. ■

In Response to 'Statistics as a Science, Not an Art: The Way to Survive in Data Science'

Joseph E. Bauer

Joseph E. Bauer is the director of survey research and evaluation at the Statistics and Evaluation Center (SEC) of the American Cancer Society — Corporate Center in Atlanta, Georgia.

MORE ONLINE
Read "Statistics *as a Science, Not an Art:* The Way to Survive in Data Science," at *http://magazine.amstat.org/blog/2015/02/01/statscience_feb2015*

This was an article that I considered spot on! It should get everyone to think about our profession and what we might be able to do as individual statisticians.

The beginning of the piece starts with advice the author's father gave him: The most important thing about solving a problem is to formulate it accurately. I received similar advice from my father to "measure twice and cut once"—which, for me, translated into spending the time on the study design, research question(s) and hypotheses, and theory before deciding on a statistical approach and implementing the study, which is all about formulating the problem accurately. When one takes the time to do this, and this happens when you talk with collaborators (who are the nonstatisticians), you increase everyone's appreciation and understanding of the problem, as well as the value that you (the statistician) bring to the table.

Do all statisticians *blithely* select a 'convenient' statistical model (akin to 'if you have a hammer, then all problems become nails to be whacked')? Well, probably not all, but undoubtedly, many do. (If one is good with survival models, then the tendency is that every problem tends to be formulated with a survival model solution as an almost 'canned solution' [hence 'convenient']).

The author's larger point is that if many statisticians are doing this, then our profession is in trouble! Maybe it is exactly this kind of behavior that has precipitated a 'de-professionalization' such that collaborators orient toward statisticians as 'technicians' who, as the author says, "the collaborators can steer to get their scientific results published." (How often have we heard "We just need the *p*-value to be less than .05"?) How many statisticians just provide that?

Of course, we have a bit of a chicken and egg problem. Is it the behavior of the statistician that causes these issues, or is this what happens when collaborators come to us at the last minute, say on grant submissions? In that scenario, they want us to add a statistical design and analysis plan on half a page (because that's all the space left in the proposal) by tomorrow morning, without the benefit of getting to read and think about the rest of the proposal. The causal dynamics probably happen from both directions. In any event, we need to think actively about what we can do to increase professionalism and being treated as professionals.

It seems to me that if this phenomenon is happening on a wide scale, this is a violation of consulting 101. Formulating the problem accurately is the goal, which means the necessary work (the hard work) is talking with the collaborators and listening to them (and vice versa) about how the data were generated and what their thinking is about various parameters, etc. How to get that dialogue started and, ideally, early in the project planning cycle is the challenge.

As the author says, "We will open up a new world to our collaborators to actually being able to generate

questions our collaborators had no idea they were even allowed to impose." We have all likely had consultations that run the gamut. The question becomes how do we get more/most of our consultations to be of the type in which "we are working together with our collaborators to correctly formulate the problem"?

I fully agree with the author when he says, "This field is open for all to contribute to, and the truth is that anybody who honestly formulates the estimation problem and cares about learning the answer to the scientific question(s) of interest will end up having to learn about these approaches and can make important contributions to our field [i.e., statistics]." However, I would add the obverse is true as well: Statisticians can contribute to disciplinary fields outside their specific academic specialty. For myself, I have learned so much from other disciplinary fields and the problems my collaborators face, which is what makes consulting fun and interesting.

We definitely need to be part of that scientific/project team solving real-world problems together. However, there are many challenges here. The quandary is that there are many collaborators who want to 'objectify statisticians' and place us in categories (i.e., geek or nerd)—and some of us wear those labels proudly. Being characterized like this tends to reflect myopic expectations—that all we do is generate some statistical formulas or graphs. Many collaborators perceive that statisticians have no disciplinary knowledge outside of that stereotype and, in the extreme, that we are not even a professional discipline, but simply technicians. This stereotype further implies that statisticians do not have any desire to interact on things that are not 'statistical'—and maybe even that we have no wish to be co-authors on manuscripts or co-investigators on grants. These conditions may, in fact, precipitate the conditions whereby statisticians gravitate toward the 'convenient' solution and thus behave in a way that leads to further de-professionalization. How do we break this self-defeating cycle?

I think the author gets us all to think more deeply about our profession. It is a clarion call about statisticians and our profession being marginalized (and how many of us may be contributing to our own demise as individuals and the marginalization of our profession). We need to ask ourselves, have we abandoned theory and have we abandoned trying to have that more robust discussion with our collaborators? ■

United States Conference on Teaching Statistics to Facilitate 'Making Connections'

The United States Conference on Teaching Statistics (USCOTS) 2015 will be held May 28–30 at the Penn Stater Hotel & Conference Center in State College, Pennsylvania. The theme of this year's conference is "Making Connections."

Plenary speakers will be Jim Stigler of the University of California at Los Angeles, Roger Peng of The Johns Hopkins University, Michael Posner of Villanova, and Shonda Kuiper of Grinnell College. The conference also will feature hands-on breakout sessions that involve participants in learning new ideas and "poster and beyond" sessions for participants to share and demonstrate their own teaching and learning innovations. The conference banquet will feature statistical "edutainment" and the presentation of the USCOTS Lifetime Achievement Award.

This is an interactive conference, where you will have the opportunity to make connections with other statistics teachers from a wide range of institutions.

Twelve pre-conference workshops also will enable participants to make connections with statistics education innovators. There is no registration fee to attend the workshops, which vary in length between a half-day and two days. Workshop times have been scheduled to allow participants to attend two options, one from each category. Advance registration is required at *www.causeweb.org/uscots*.

1–2-Day Workshops

- Bringing Passion to Your Introductory Statistics Classroom: A Supportive, Multidisciplinary Project-Based Approach, led by Lisa Dierker of Wesleyan University
- Teaching the Statistical Investigation Process with Simulation- and Randomization-Based Inference, led by Nathan Tintle of Dordt College; Beth Chance, Allan Rossman, and Soma Roy of Cal Poly; and George Cobb of Mount Holyoke College
- Basics of Data Science in R and R-Studio, led by Daniel Kaplan of Macalester College and Nicholas Horton of Amherst College
- Developing and Using Electronic Assessments to Inform Instruction in Introductory Statistics, led by Amy Froelich and Kathleen Rey of Iowa State University

USPROC entry open

The Consortium for the Advancement of Undergraduate Statistics Education (CAUSE) in conjunction with the American Statistical Association via a member initiative grant is accepting applications for its sixth annual undergraduate statistics project competition (USPROC). The purpose of USPROC is to encourage the development of data analysis skills, enhance presentation skills, and recognize outstanding work by undergraduate statistics students.

There are two main categories for submissions to the competition:

The Undergraduate Statistics Research Project (USRESP) competition is for undergraduate students who conduct research projects that are statistically related, either methodological or applied. These projects may include research work from REU research projects, senior capstone research projects, or independent research projects that are not based on a specific course students are taking.

The Undergraduate Statistics Class Project (USCLAP) competition is for undergraduate students taking an applied statistics course(s) at introductory or intermediate levels in which a class project is part of the course work (either required or optional).

All levels of projects for both competitions are encouraged.

Visit *www.causeweb.org/usproc* for details, contact information, and a link for submitting your project. The submission deadline is May 31, with winners announced in the summer of 2015. Cash prizes are available.

Also, save the date of October 2 for the first electronic undergraduate statistics research conference, where USPROC student winners and others will present their work.

- Embedding Undergraduate Statistics Courses and Research into a Living-Learning Community, led by Mark Daniel Ward of Purdue University
- Teaching Data Science, led by Chris Malone of Winona State University

Three-Hour Workshops

The following six three-hour workshops will be held May 28 and conclude before the USCOTS opening session:

- A Flipped Classroom Approach to Introductory Data Science, led by Lillian Cassel and Michael Posner of Villanova University
- Exercises for Teaching Statistics with Simulations, Resampling Methods, and Big Data, led by Mia Stephens and Julian Parris of the JMP Division of SAS Institute, Dick De Veaux of Williams College, and Brant Deppa of Winona State University
- Engaging Intro Statistics Students with Activities, led by Diane Evans and Eric Reyes of Rose-Hulman Institute of Technology
- Using LaunchPad in Introductory Statistics Courses for Online Homework and Assessment, led by Karen Carson of W.H. Freeman
- Modules for Teaching Statistics with Pedagogies Using Active Learning (MTStatPAL) as Part of a Flipped Classroom Model, led by Ginger Rowell of Middle Tennessee State University
- Making the Most of StatCrunch in Your Introductory Statistics Course, led by Webster West of North Carolina State University

Workshop abstracts and details about availability of support for lodging can be found at *www.causeweb.org/uscots/uscots15/workshops*. ■

Twice as Nice

Conference on Statisical Practice has another successful year

Sylvia Dohrmann, CSP Steering Committee Chair

Photos by Sara Davidson, ASA graphic designer and production coordinator

Even better the second time around! The Conference on Statistical Practice (CSP) was back in New Orleans this year February 19–21 at the Sheraton New Orleans (*www.amstat.org/meetings/csp/2015)*. More than 400 attendees and participants enjoyed short courses, oral sessions, poster sessions, tutorials, practical computing demonstrations, and the keynote address provided by 2015 ASA President David R. Morganstein. (See the President's Corner for more about David's keynote and his experience at the conference.)

CSP continues to grow each year, highlighting the importance for a conference dedicated to serving the needs of statistical practitioners by providing a forum to learn, share, and discuss statistical techniques, innovations, and best practices. Still, the small size allows for a more personal environment, making it easier for attendees to participate in discussion during the sessions and courses and connect with each other during the scheduled break times. By design, the CSP conference space is generally one common area in which the exhibitor booths, opening mixer, poster sessions, continental breakfasts, and breaks are shared. Every year, we receive comments regarding the advantages of the unique set-up and small size that allow for enhanced networking.

One of the most popular themes continues to be "Communication, Impact, and Career

(Left) ASA President David Morganstein presents "Communication: A Two-Way Street," during the keynote address February 20 at the Conference on Statistical Practice in New Orleans, Louisiana. (Below) Attendees mingle during a refreshment break.

Dick De Veaux of Williams College presents "Practical Data Mining: Challenges and Solutions."

Paul Teetor of Quant Development LLC presents "What Can We Learn from Software Engineers?"

Photos by Sara Davidson, ASA graphic designer and production coordinator

Attendees at the Conference on Statistical Practice mingle during the opening mixer and poster session.

TWEETED AT CSP:

@Rickey_Carter

Says it all **#CSP2015**

@data drivenmama Super excited to be headed to N.O. for **#CSP2015** aka ComicCon for data nerds

@EricBStephens A great first day of **@AmstatNews #CSP2015** in NOLA, with several interesting courses and posters, and lots of discussion! **#stats**

@JeanVAdams What does a 3D bar graph say to **@Nbrgraphs?** "Look what I can do with my computer!" Avoiding graphical mistakes at **#CSP2015**.

@charites Nzephyr #CSP2015 last day. I'm at information overload but in a good way. Met so many brilliant people.

Development," which was also highlighted in the keynote address. The courses and sessions in this theme provide participants with tools that can be used to enhance communication with colleagues and customers, have a positive impact on their organization, and develop leadership skills.

As part of this theme, the CSP Mentoring Program continues to be a success. Developed by the Committee on Applied Statisticians, the program establishes 1:1 mentoring relationships to help provide an opportunity to enhance personal and professional development goals. The program was limited to 40 participants and filled quickly.

New this year was the Collaboration Corner, where conference attendees casually met and discussed topics in small groups. Tables set in the corner of the exhibit hall provided a semi-private and accessible place for participants to meet. The Collaboration Corner enhanced opportunities for social interaction, engagement, and networking among conference attendees.

Also new this year was the recognition of outstanding student posters. The CSP 2015 Best Student Poster Award went to Emiliana Inez Patlan of SolarWinds for "Predicting Buying Behavior: IT Software Customer Clustering with R and Weka." The runners-up were David Kline of The Ohio State University for "Multiple Imputation for Missing Data in Longitudinal Research Synthesis: Identifying and Overcoming Assumptions in Software" and Patricia Rodríguez de Gil of the University of South Florida for "An Empirical Investigation of the Impact of Measurement Error on Propensity Score Analysis."

Alex Gilgur meets with Jean Adams in the new "Collaboration Corner."

Look for all this and more in sunny San Diego, California, which will host CSP 2016. ■

Focus on Terry Speed, NISS 2014 Jerome Sacks Award Winner

Terry Speed, professor emeritus at the University of California-Berkeley and head of bioinformatics at the Walter and Eliza Hall Institute for Medical Research in Melbourne, Australia, recently won the National Institute of Statistical Sciences 2014 Jerome Sacks Award for Multi-Disciplinary Research. According to the nominating committee, "Speed is a pioneer in the development and application of statistical methods for the analysis of biomedical and genomic data. His work exemplifies the best of applied statistics in cross-disciplinary research and is notable for its creativity, rigor, and relevance." Read on to learn a little more about Speed.


Speed

What got you interested in the field of statistics?
I studied math and statistics as an undergraduate, with a side interest in genetics. I liked all three, with statistics winning eventually, after I did a PhD in math, and later I came back to genetics.

Who were some of your influencers?
My number-one influencer was R.A. Fisher. He died in the year I took my first statistics course (1962), but his influence was there in both statistics and genetics.

What are you working on today?
Mainly cancer genomics and epigenomics. In the last few years, we have made an almost complete transition from microarrays to analyzing DNA and RNA sequence data. We study DNA variation using whole genome or whole exome DNA sequence variation, including changes in copy number, gene expression using the technique known as RNA-seq, methylation with sequencing bisulphite-treated DNA, and histone and other modifications using ChIP-seq data. The goal is typically to find molecular and genetic changes associated with clinically significant outcomes such as response or resistance to treatment, recurrence, or survival. We look not just for genes, but for broader events. Hot topics right now in cancer genomics are tumor heterogeneity and evolution and the response of the immune system.

What advice would you give an aspiring statistician getting into interdisciplinary work?
First, I never give advice. Second, if I did, I would just say the obvious: Find an area of application about which you feel passionately.

Anything else you would like to add?
I think motivation is everything in research. You have to gravitate to an area in which you love working. ■

NISS 2015 Jerome Sacks Award

If you know someone who, like Terry Speed, is a leader in sustained, high-quality cross-disciplinary research involving the statistical sciences, consider nominating that person for the NISS 2015 Jerome Sacks Award for Outstanding Multi-Disciplinary Research. To nominate an individual, submit as one PDF document the following information to *sacksaward2015@niss.org* by May 25:

1) Nomination letter (maximum two pages)

2) Contact information for two individuals (other than nominator) who have consented to provide letters of support

3) CV

Emery Brown Elected to National Academy of Engineering

ASA member Emery N. Brown was elected to the National Academy of Engineering (NAE) recently. Brown, a professor at Harvard Medical School and Massachusetts Institute of Technology, was honored for developing neural signal processing algorithms for understanding memory encoding and modeling of brain states of anesthesia. He is one of a few people who is a member of all three of the National Academies—Institute of Medicine, National Academy of Sciences and NAE. "It is a noteworthy achievement and one that demonstrates the value that members of our profession bring to addressing important real-world problems," said ASA President David Morganstein. "Indeed, congratulations are in order, but I think what I most want to say is, 'Thank you for being a superb example of what is possible when talent and dedication are combined in service of science and society.'" added ASA Executive Director Ronald L. Wasserstein. To read more, visit *http://bit.ly/1CB92sv*. ■

Infinite Possibilities Conference Held at Oregon State University

Sastry Pantula and Srila Nayak

The biennial 10th Infinite Possibilities Conference (IPC) (*http://ipcmath.org/conference.html*)—which focused on empowering, educating, celebrating, and promoting the careers of under-represented minority women in mathematical and statistical sciences—was held at Oregon State University (OSU) March 1–3.

MORE ONLINE
To view photos from this event see *http://magazine.amstat.org/blog/2015/03/17/infinite-possibilities-conference.*

IPC is a program of Building Diversity in Science (*www.diversityinscience.org*), a nonprofit organization that encourages diverse students to enter STEM disciplines.

Sastry G. Pantula, dean of the college of science, lobbied to bring the IPC to Oregon State this year and shares IPC's commitment to greater inclusivity, innovation, and diversity in the mathematical and statistical sciences.

"We are committed to enhancing excellence through diversity in science and mathematics at OSU. I am thrilled to welcome the IPC to campus, which has done so much in the last decade to mentor, empower, and increase participation of minority women in the mathematical and statistical sciences," said Pantula.

The conference attracted more than 230 participants from 19 states, Mexico, and Puerto Rico. More than 80 undergraduates, graduate students, and postdocs participated in a mix of sessions, including professional development workshops, panels on race/gender in the context of quantitative sciences, and a short course in biostatistics. Download a PDF of the conference program at *http://bit.ly/1NJRAps*.

Throughout the three days, students networked and conversed with and learned from a cohort of high-achieving role models in statistics and mathematics. These included University of California at Berkeley–educated biostatistician Tanya Moore, founder of IPC and an education policy adviser; Talithia Williams, statistician and the first African-American woman to earn tenure at Harvey Mudd College; and Deborah Jackson, NSF program director and fellow of the National Society of Black Physicists.

The discussions encouraged young women to reflect on, learn from, and overcome challenges as they pursued careers in mathematical and statistical sciences. Speakers paid tribute to mentors and advocates who pushed and encouraged them to succeed.

In her keynote address, Erika Camacho shared a story of how she, a young girl from Mexico whose family struggled to make ends meet, ended up with a PhD in applied mathematics from Cornell University. Currently an assistant professor at Arizona State University, Camacho had a message for the crowd: "Becoming a successful quantitative scientist requires two things: the individual and the community."

Williams shared her own academic and personal journey, learning a powerful life lesson of how failure leads to success. She also explained her statistical disease modeling research that has proven successful in predicting the cataract incidence rate in developing countries in Africa.

Attendees at all stages of their careers participated in numerous roundtables and breakout sessions focused on topics such as applying to graduate school, pathways outside academia, building a sustainable research program, and work-family life equilibrium.

Statistical presentations featured the diverse uses of statistical software, tools for predicting patterns in genetic data, and analyses of Alzheimer's disease studies. A panel on the Big Data boom highlighted the need for a combination of foundational statistics courses and data mining; training in software programing tools such as SAS, R, and Python; and communication skills to succeed in the current data-driven job market.

The conference concluded with an awards ceremony. The Etta Z. Falconer Award for Mentoring & Commitment to Diversity was presented to Genevieve Knight, a retired educator from Coppin State University and a pioneering advocate for equity and inclusion of women and minorities in the mathematical sciences. ■

Twin Cities Chapter Attends First Career Exploration Fair

More than 100 high-school students attended

Grant Weller

Members of the Twin Cities Chapter represented the statistics profession at a career exploration fair for local high-school students held February 28. More than 100 students from area schools attended the inaugural event, held in Elk River, Minnesota.

Chapter members Louise Johnson of Quintiles, Grant Weller of Savvysherpa, and Brad Carlin and Julian Wolfson of the University of Minnesota shared aspects of their experiences as statisticians and offered advice to students interested in statistical careers.

Carlin and Wolfson also shared information about the University of Minnesota's Summer Institute in Biostatistics (SIBS), a six-week program providing undergraduate students with training in biostatistics, epidemiology, and statistical computing. For 2015, the University of Minnesota is one of eight institutions hosting SIBS, a program supported by the National Heart, Lung, and Blood Institute. In addition to the biostatistical training, the program includes scientific seminars; opportunities to visit local organizations (such as the Mayo Clinic and Medtronic, Inc.) where biostatisticians work; and social events such as picnics, shopping, and Twins and Lynx games. Details are available at *http://sph.umn.edu/programs/sibs*.

From left: Twin Cities Chapter members Grant Weller, Brad Carlin, Louise Johnson, and Julian Wolfson enjoy the career fair.

The Twin Cities Chapter boasts a membership of nearly 200, representing three academic statistical research departments (University of Minnesota Division of Biostatistics and School of Statistics and Mayo Clinic Division of Biomedical Statistics and Informatics); educators at local colleges and universities; and industrial statisticians working in health care and life sciences research, marketing, and the insurance industry, among others. ■

Connect!

Start an **ASA Student Chapter** at Your School

The ASA Student Chapters program is designed to provide opportunities for students to connect with other students interested in statistics and interact with prominent statisticians locally and at national meetings. Other benefits of being involved in a student chapter include:

- Access to your own chapter microsite at the ASA: We can give you the tools to create your own, or we'll create it for you
- Free ASA membership for your chapter president
- Free items such as T-shirts, caps, and plastic cups with your chapter logo
- Funding to hold social events for your chapter
- Timely information regarding special activities for students at national and local meetings
- Speakers for your chapter meetings
- Great ideas for local program activities from ASA websites

There are no scholastic requirements or costs to start a student chapter at your school, but your student chapter president must be an active member of the ASA. Not already a member? No problem! We'll give your president a free annual membership. Other members of your chapter may join the ASA for only $17 per year.

Start Your ASA Student Chapter Today

Learn more at *http://stattrak.amstat.org/student-chapters*.

To find out more about ASA Student Membership, visit *http://stattrak.amstat.org/membership*.

Biometrics

Edited by Sheng Luo, Biometrics Section Publications Officer

The Biometrics Section will sponsor two Continuing Education courses and six invited sessions at the 2015 Joint Statistical Meetings in Seattle, Washington. To view the list of courses and invited sessions, as well as the winner of the travel awards and Byar Young Investigator Award, visit *http://bit.ly/1EXsH5y*.

Grant Opportunity

The section invites applications for funding to support initiatives developing innovative outreach projects focused on enhancing awareness of biostatistics among quantitatively talented U.S. students. Of particular interest are projects that encourage students to pursue advanced training in biostatistics.

The section will fund up to three projects, with total funding of $3,000 to $5,000 per project this year. The project timelines are from 1–1.5 years. Investigators at all levels are encouraged to apply.

Award recipients must be ASA and Biometrics Section members prior to project initiation.

A three-page application is due May 30 in the following format:

- Title, Objectives, and Specific Aims
- Background, Significance, and/or Rationale
- Design and Methods
- Deliverables/Products
- Personnel/Budget

Permitted expenditures include supplies and other program costs, domestic travel when necessary to carry out the project, professional expertise (e.g., instructional designer or webmaster), and cost of computer time. Nonallowable expenditures include secretarial/administrative personnel, tuition, foreign travel, faculty salaries, research expenses, and honoraria and travel expenses for visiting lecturers to the investigator's home institution.

A project period with a start date no earlier than July 1 and an end date no later than December 31, 2016, also should be specified.

Applications should be submitted electronically to the strategic initiatives subcommittee chair, Roslyn Stone, at *Roslyn@pitt.edu*.

All investigators will be expected to submit a brief report at the conclusion of the project to the subcommittee chair. Questions should be addressed to either Stone or the subcommittee co-chair, Page Moore, at *PMoore@uams.edu*. ■

Health Policy Statistics Section (HPSS)
Biennial Awards – Call for Nominations

The next set of HPSS awards will be presented at the Eleventh International Conference on Health Policy Statistics (ICHPS) October 7-9 in Providence, Rhode Island. *These awards honor individuals who have made significant contributions to the development of statistical methods or have developed innovative statistical applications for health care policy or health services research, to encourage research in this area and to increase awareness of the HPSS in the statistical community. Candidates for awards should be recognized leaders in the field, with outstanding contributions through methodological or applied work in statistics. Candidates for the Long-Term Excellence Award should have contributed significantly through mentoring and/or service that advance the aims of the Section. Candidates for the Mid-Career Award should bring the promise of continued excellence at the frontier of statistical practice and research in health care policy, thus advancing the aims of the Section.*

HPSS Mid-Career Award Recipient **must be** within 15 years of their terminal degree on January 1, 2015 and cannot be a previous HPSS Mid-Career Award winner. The 2013 winner was Susan Paddock, RAND Corporation.

HPSS Long-Term Excellence Award Recipient **cannot** be within 15 years of their terminal degree on January 1, 2015 and cannot be a previous HPSS Long-Term Excellence Award winner. The 2013 winners were Naihua Duan, Columbia University and Robert Gibbons, University of Chicago.

Nominations should be sent by midnight on May 8, 2015
to the HPSS Awards Committee
at paddock@rand.org

Please include: **[1]** the nominee's curriculum vitae **[2]** a letter (not to exceed two pages) from the nominator (self-nominations are welcome) summarizing the nominee's credentials for the award **[3]** additional independent (other than the nominator or nominee) evaluation letters may be provided, but are not necessary **[4]** contact information for the nominee or nominator (if different)

2015 HPSS Awards Committee: Arlene Ash, Marc Elliott, Robert Gibbons, Sharon-Lise Normand, Susan Paddock (Chair)
Questions should be directed to paddock@rand.org

Physical and Engineering Sciences

Ananda Sen, SPES JSM Program Chair-elect

The ASA Section on Physical and Engineering Sciences will sponsor three roundtables covering topics from being a Bayesian in a collaborative environment to what it takes to be successful as a statistician in industry.

Sabyasachi Basu from Boeing will offer his perspectives on a successful transition from academia to industry and vice versa in "Academia and Industry: Can a Statistician Move Successfully from One to the Other?" **Stephanie DeHart** from DuPont will discuss job search tips for soon-to-be graduate students in "SWING Into a Successful Statistical Career." Finally, **Alyson Wilson** from North Carolina State University will share her collaborative insights as a Bayesian in "Infusing Bayesian Thinking in Collaborative Projects."

Roundtables are a forum to exchange ideas with peers in a small-group setting. To encourage student participation, SPES will provide scholarships for students to attend one of these roundtables. Interested students should send his/her CV and a brief cover letter expressing interest for a specific roundtable to Ananda Sen at *anandas@umich.edu* by May 4.

Details are available at *http://magazine.amstat.org*. ■

Quality and Productivity

Q&P's invited session for JSM 2015 is "Preparing Students to Work in Industry." Representatives from diverse academic programs at Virginia Tech, Carnegie Mellon, and Ohio State will share creative aspects of their programs that train students for interdisciplinary research, collaboration, and statistical practice in industry. The academic presentations will be followed by comments from industry discussants, including those from P&G (consumer products), Lubrizol (chemical company), and Exponent (consulting company). There will be time reserved at the end of the session for questions and comments from the audience. ■

Professional Opportunity listings may not exceed 65 words, plus equal opportunity information. The deadline for their receipt is the 20th of the month two months prior to when the ad is to be published (e.g., May 20 for the July issue). Ads will be published in the next available issue following receipt.

Listings are shown alphabetically by state, followed by international listings. Vacancy listings may include the institutional name and address or be identified by number, as desired.

Professional Opportunities vacancies also will be published on the ASA's website (*www.amstat.org*). Vacancy listings will appear on the website for the entire calendar month. Ads may not be placed for publication in the magazine only; all ads will be published both electronically and in print.

Rates: $320 for nonprofit organizations (with proof of nonprofit status), $475 for all others. Member discounts are not given. For display and online advertising rates, go to *www.amstat.org/ads.*

Listings will be invoiced following publication. All payments should be made to the American Statistical Association. All material should be sent to *Amstat News*, 732 North Washington Street, Alexandria, VA 22314-1943; fax (703) 684-2036; email *advertise@amstat.org*.

Employers are expected to acknowledge all responses resulting from publication of their ads. Personnel advertising is accepted with the understanding that the advertiser does not discriminate among applicants on the basis of race, sex, religion, age, color, national origin, handicap, or sexual orientation.

Also, look for job ads on the ASA website at *www.amstat.org/jobweb.*

Colorado

■ Business Analytics: Assistant or Associate Professor (or Visiting Professor) of Business Analytics, University of Colorado Denver. Full-time, tenure-track, 9-month faculty position starting fall 2015; 40% teaching; 40% research; 20% service. Teaching load consists of four three-hour courses during 9-month contract. Requires: PhD in statistics or closely related field. For full description, requirements, and application process, go to *www.jobsatcu.com/postings/95175.* The University of Colorado is committed to diversity and equality in education and employment. The university is committed to recruiting and supporting a diverse student body, faculty, and administrative staff. The university strives to promote a culture of inclusiveness, respect, communication, and understanding. We encourage applications from women, ethnic minorities, persons with disabilities, and all veterans.

Florida

■ The University of Central Florida invites applications for chair of the department of statistics. Applicants must have a PhD in statistics or a closely related field and be qualified to be a tenured full professor in the department. Apply online at *www.jobswithucf.com* to submit cover letter, CV, and description of research interests. Arrange three letters of reference to be sent to Aida Encarnacion (*Aida.Encarnacion@ucf.edu*). UCF is an equal opportunity/affirmative action employer. All qualified applicants are encouraged to apply, including minorities, women, veterans, and individuals with disabilities. As a Florida public university, UCF makes all application materials and selection procedures available to the public upon request.

Indiana

■ Consultant/Lecturer. Indiana University Department of Statistics. Begin 7/1/2015. MS in statistics or related field. Consult at Indiana Statistical Consulting Center (*www.iub.edu/~iscc/*), teach two courses per year. Commitment to teaching excellence is essential. Apply at *http://indiana.peopleadmin.com/postings/1426.*

Think your niche might be software development?

Join SAS R&D and build a rewarding career creating the world's leading statistical software. Learn new areas of statistics and grow your computational skills. Make a difference in a professional environment where people thrive on collaboration and a positive work-life balance.

Research Statistician Developers

Positions require excellent C programming skills, a PhD in statistics or a related field, and specialization in one of the following areas.

- Research Statistician Developer
  Latent Variable Models -20005286
- Research Statistician Developer
  Causal Analysis-20005285
- Research Statistician Developer
  Statistical Quality Improvement-20004591
- Research Statistician Developer
  Econometrics 20005159
- Research Statistician Developer
  Financial Econometrics 20005186
- Research Statistician Developer
  Forecasting 20005489
- Research Statistician Developer
  Machine Learning Developer-20005271

Research Statistician Testers

Positions require programming experience using a matrix-oriented language, an advanced degree in statistics or a related field, and broad statistical knowledge.

- Research Statistician Testers
  Analytics Tester – 20005403

As part of the SAS team, you will benefit from our company's work-life programs and unique corporate culture. SAS continues to receive accolades as one of the best companies to work for in America. Living in the Raleigh-Durham-RTP, NC, area offers the best in educational, cultural, sporting and recreational amenities.

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Learn more:
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sas
THE POWER TO KNOW.

Stony Brook University

Faculty Positions in the Institute for Advanced Computational Science

Applications are invited for four tenure-track faculty positions of any rank (including endowed chairs), in applied mathematics and computer science in the Institute for Advanced Computational Science (IACS) at Stony Brook University. Candidates wishing to apply should have a doctoral degree in Applied Mathematics or Computer Science, though a degree in related fields may be considered. Ten years of faculty or professional experience is required for a senior position along with a demonstrated record of publications and research funding. A demonstrated record of publications and a demonstrated potential for research funding is required for any junior faculty. The selected candidate is expected to participate in interdisciplinary program development within the Institute and to establish a research program with a solid funding base through both internal and external collaborations. Of specific interest is research in, for example, programming models, algorithms, or numerical representations that advance scientific productivity or broaden the benefit and impact of high-performance computing. The selected candidates will have access to world-class facilities including those at nearby Brookhaven National Laboratory.

The Institute for Advanced Computational Science (**http://iacs.stonybrook.edu/**) was established in 2012 with an endowment of $20M, including $10M from the Simons Foundation. The current ten faculty members will double in number over the next few years to span all aspects of computation with the intent of creating a vibrant multi-disciplinary program. IACS seeks to make sustained advances in the fundamental techniques of computation and in high-impact applications including engineering and the physical, life, and social sciences. Our integrated, multidisciplinary team of faculty, students, and staff overcome the limitations at the very core of how we compute, collectively take on challenges of otherwise overwhelming complexity and scale, and individually and jointly define new frontiers and opportunities for discovery through computation. In coordination with the Center for Scientific Computing at Brookhaven National Laboratory, our dynamic and diverse institute serves as an ideal training and proving ground for new generations of students and researchers, and provides computational leadership and resources across the SBU campus and State of New York.

The search will remain open until suitable candidates are found with the first round of applications due May 15, 2015. All candidates must submit the required documentation online through the link provided below. Please input a cover letter, your curriculum vitae, a research plan (max. 2 pages) which should also describe how graduate and undergraduate students participate, a one-page statement of your teaching philosophy, a publication list, your funding record, and three reference letters to: **https://iacs-hiring.cs.stonybrook.edu**.

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Our company was founded in 1961 by three statisticians. The current staff of more than 2,000 includes over 60 statisticians, as well as research, technical, and administrative staff. In addition, our professional staff is supported by data collection and processing personnel situated locally and in field sites around the country. The work atmosphere is open, progressive, and highly conducive to professional growth.

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Survey Sampling Statistician

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Westat offers excellent growth opportunities and an outstanding benefits package including life and health insurance, an Employee Stock Ownership Plan (ESOP), a 401(k) plan, flexible spending accounts, professional development, and tuition assistance. To apply, go to **www.westat.com/careers**.

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Questions to Kelly Hanna *khanna@indiana.edu*. Indiana University is an equal employment and affirmative action employer and a provider of ADA services. All qualified applicants will receive consideration for employment without regard to age, ethnicity, color, race, religion, sex, sexual orientation or identity, national origin, disability status, or protected veteran status. IU is responsive to the needs of dual-career couples.

■ Lecturer position in Indiana University Department of Statistics (*www.stat.indiana.edu*). Nontenure track. Teach five courses per year; contribute to degree programs; participate in faculty governance. PhD in statistics or related field required. Commitment to teaching excellence is essential. Interest/experience in teaching business statistics is especially desired. Apply by April 13 at PeopleAdmin, *http://indiana.peopleadmin.com/postings/992*. Address questions to Kelly Hanna at *khanna@indiana.edu*. Indiana University is an equal employment and affirmative action employer and a provider of ADA services. All qualified applicants will receive consideration for employment without regard to age, ethnicity, color, race, religion, sex, sexual orientation or identity, national origin, disability status, or protected veteran status. IU is responsive to the needs of dual-career couples.

Maine

■ The department of mathematics and statistics at the University of Maine is seeking to fill an assistant professorship effective August 2015. This is a one-year position, which may be renewable contingent on funding and mutual interest and scholarly activities in interdisciplinary research and consulting in the applied, biological, and social sciences. Candidates must possess a PhD by September 1, 2015. For details, visit *umaine.hiretouch.com/job-details?jobID=21407&job=assistant-professor-of-statistics.* The University of Maine is an EEO/AA employer. All qualified

applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, sexual orientation, age, disability, protected veteran status, or any other characteristic protected by law.

North Carolina

■ The department of biostatistical sciences, Wake Forest School of Medicine, Winston-Salem, NC, is recruiting a PhD in biostatistics, statistics, computer science, or informatics. Expertise in managing large medical record data sets such as administrative claims (CMS) or Epic. Collaboration on local and national medical research projects, methodologic research, and teach graduate courses in biostatistics/bioinformatics. Email CV to Monica Kiger, *mkiger@wakehealth.edu* AA/EOE.

Ohio

■ The Cleveland Clinic Department of Quantitative Health Sciences is recruiting for faculty positions. In particular, specialists in longitudinal modeling or bioinformatics are being sought. Details for all positions, as well as application instructions, are on our website: *www.lerner.ccf.org/qhs/jobs/* EOE.

Tennessee

■ Austin Peay State University — The department of mathematics and statistics at Austin Peay State University invites applications to fill a tenure-track position for the 2015–2016 academic year. Rank (assistant/associate) will be granted commensurate with experience. See description; applications taken online only at *www.apsu.edu/human-resources/faculty.* Austin Peay State University is an AA/EEO employer and does not discriminate on the basis of race, color, creed, ethnic or national origin, gender (including pregnancy), sexual orientation/gender identity, religion, age, disability status, genetic information, and/or veteran status in its programs and activities. Inquiries or complaints regarding the nondiscrimination policies should be directed to the Office of Equal Opportunity and Affirmative Action at *Nondiscrimination@apsu.edu.*

Head, Department of Biostatistics
University of Iowa, College of Public Health

The University of Iowa, College of Public Health is seeking a head for the Department of Biostatistics to provide strategic and innovative academic leadership for the department's research, service, and teaching activities. The College of Public Health was founded in 1999 and is Iowa's only CEPH-accredited school of public health. The college is nationally ranked among the top 10 in publicly-supported schools of public health and has a diverse research portfolio. The faculty are collaborative and highly productive with expertise in all disciplines of public health. Innovation in education is highly valued and we have a track record of well-established and highly successful graduate and professional training programs. Degree programs in the college include MS, PhD, MHA, and MPH.

The Department of Biostatistics is one of five departments in the College of Public Health. There are 14 faculty, 42 staff, and 52 students currently in the department. Faculty research interests are broad and include computer intensive statistics, Bayesian statistics, design and analysis of clinical trials, longitudinal data analysis, survival analysis, spatial modeling, analysis of missing data, time series, model selection, quality control, informatics, statistical genetics, and public health statistics. The department also houses two centers - the Biostatistics Consulting Center and the Clinical Trials Statistical Data Management Center. In addition, the collegiate Center for Public Health Statistics is directed by biostatistics faculty. Department faculty members enjoy strong collaborative relationships with other departments in the College of Public Health as well as the Carver College of Medicine, the Department of Statistics and Actuarial Science, the Institute for Clinical and Translational Science, the Iowa Institute of Human Genetics, and the Informatics Initiative. Faculty in the department also support the biostatistics shared resource in the Holden Comprehensive Cancer Center, a NCI-designated comprehensive cancer center at the University of Iowa. The Department of Biostatistics offers the following degree programs: Certificate in Biostatistics, MPH in Quantitative Methods, and MS and PhD in Biostatistics. They also host the Iowa Summer Institute in Biostatistics which provides biostatistical training and applied research opportunities to undergraduates. Further information about the department can be found at: http://www.public-health.uiowa.edu/biostat/

Reporting to the dean of the College of Public Health the head will:

- serve as a member of the collegiate leadership team that guides the strategic initiatives and resources to allow the college to meet its mission, vision, and goals;
- provide effective management of the department's budget that encompasses all funding sources;
- provide leadership for the department's diverse research program;
- ensure compliance with collegiate, university, state, and federal policies related to grant funding, legislative, and academic policies;
- support a collaborative and collegial culture that is inclusive, diverse, supportive, and values faculty, staff, and students;
- recruit and retain excellent faculty, particularly those from underrepresented backgrounds, and encourage faculty development with strong and effective mentorship;
- foster a learning environment that attracts a diverse student body; and
- maintain an active scholarship portfolio, including external funding and peer-reviewed publications.

Candidates must have a PhD, ScD or equivalent degree in a related field and credentials commensurate with an appointment as a tenured, full professor in the College of Public Health. Candidates are expected to have a demonstrated record of administrative experience in an academic setting and a strong and distinguished record of scholarly research, teaching, and mentoring. In addition, candidates must have a demonstrated commitment to promoting a diverse environment.

Candidates must submit applications online at http://jobs.uiowa.edu/ requisition #65916. Inquiries regarding the position can be made to Peter S. Thorne, the Search Committee Chair, at peter-thorne@uiowa.edu. The Search Committee will continue to screen applicants until the position is filled. Nominations and applications should include a letter outlining interest and relevant experience, curriculum vitae, and the names and contact information for three references.

The University of Iowa is an equal opportunity affirmative action employer. All qualified applicants are encouraged to apply and will receive consideration for employment free from discrimination on the basis of race, creed, color, national origin, age, sex, pregnancy, sexual orientation, gender identity, genetic information, religion, associational preference, status as a qualified individual with a disability, or status as a protected veteran.

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HOW WE CELEBRATED: Communications Manager **Megan Murphy** brought in two home-made pies — winterberry and blackberry — for those of us at the Mothership. They didn't last long.

Meg Ruyle • @Amstat_Meg
50% of the people in this @Amstat_News meeting had pie. Are you ready for #piday? We are.

Kel Zou Pie in the sky at 3-14-15-9-26!

CBat • @ImADataGuy
@Amstat_News listened to Geek music, watched Star Trek Enterprise, wore my Einstein tshirt, and had pizza for dinner :-)

Chris Aloia Apple Pi

Holly Hacker • @hollyhacker
Stats 911 for journos. @rob_barry says call @AmstatNews #nicar15

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WWII turned statistics from "the playing field of dilettanti and controversialists into a serious branch of science" econ.st/13Bxme9

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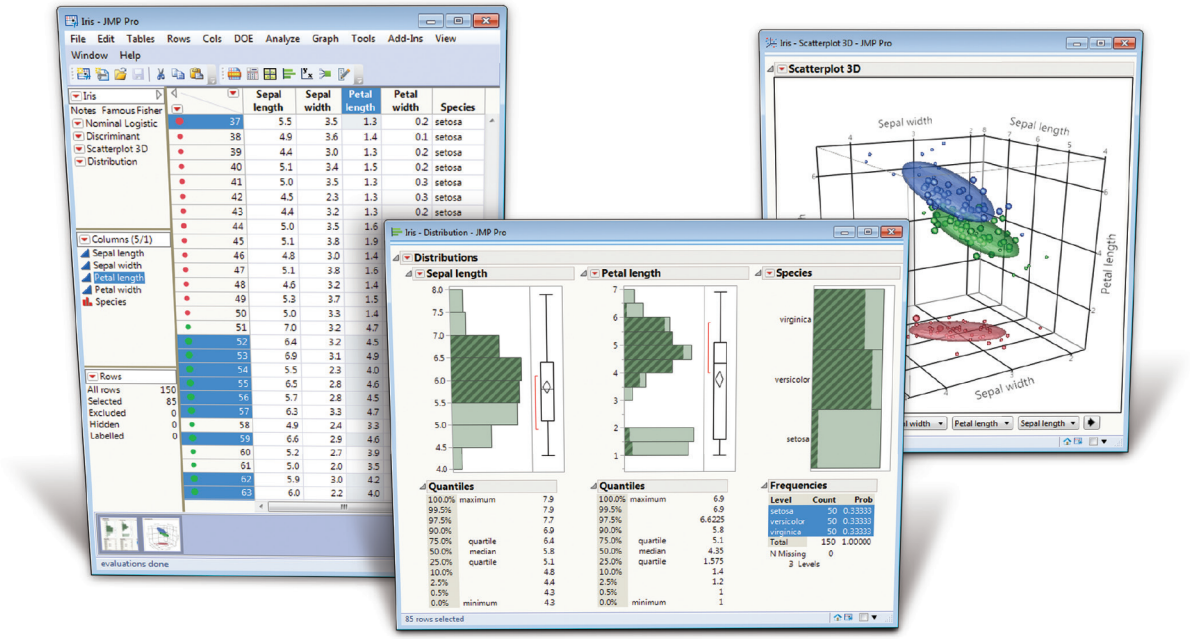
@amcafee And today statisticians are in incredibly high demand (US job growth of 27% by 2022) thisisstatistics.org



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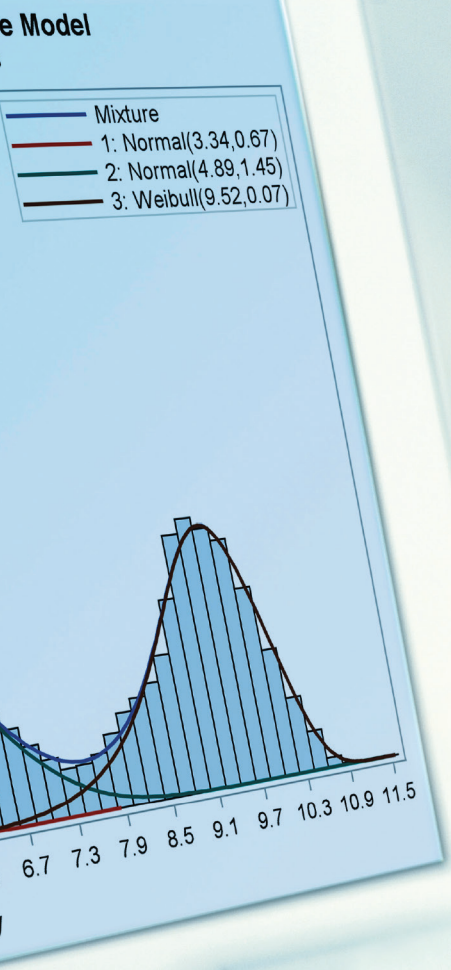

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