

November 2015 • Issue #461

AMSTATNEWS

The Membership Magazine of the American Statistical Association • <http://magazine.amstat.org>

The ASA

Fellow 2015 UPDATE

ASA
NEW

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ALSO:

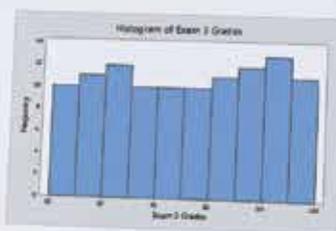
Statisticians in
Sierra Leone

Technological Advance
and Economic Growth:
Stagnation or Revival?

The Identity of Statistics
in Data Science

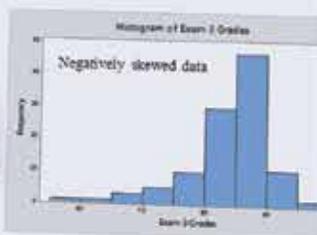
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Mean (~71.86) and median (73) are about the same



Mean (~75.04) and median (75) are about the same

Mean (~66.32) is greater than the median (62)

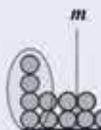


Mean (~83.50) is less than the median (89)

Measures of Spread

mean as the fulcrum point that is balanced by the same weight, in per

modes



Also noted in each picture are the modes (circled) and location of the definitions of these statistics are contained in the following pages.

Example 1

Ten batteries from brands A, B, and C were tested to determine their

Brand A:	41	289	214	102	38	94	175
Brand B:	39	65	22	64	22	191	99
Brand C:	24	95	139	122	41	360	318

Here are the lifetimes plotted as comparison dotplots in Minitab:

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Lessons



Activities



Answer Keys



Data Sets

AMSTATNEWS

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Amstat News welcomes news items and letters from readers on matters of interest to the association and the profession. Address correspondence to Managing Editor, *Amstat News*, American Statistical Association, 732 North Washington Street, Alexandria VA 22314-1943 USA, or email amstat@amstat.org. Items must be received by the first day of the preceding month to ensure appearance in the next issue (for example, June 1 for the July issue). Material can be sent as a Microsoft Word document, PDF, or within an email. Articles will be edited for space. Accompanying artwork will be accepted in graphics file formats only (.jpg, etc.), minimum 300 dpi. No material in WordPerfect will be accepted.

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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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Teaching Statistics
and Data Science
at a Community
College

columns

20 MASTER'S NOTEBOOK Statisticians in Sierra Leone

This column is written for statisticians with master's degrees and highlights areas of employment that will benefit statisticians at the master's level. Comments and suggestions should be sent to Megan Murphy, *Amstat News* managing editor, at megan@amstat.org.

23 SCIENCE POLICY Technological Advance and Economic Growth: Stagnation or Revival?

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.



Online Articles

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

Following the recent decisions of the **NSF Division of Mathematical Sciences (DMS)** to sunset two of its mathematical sciences institutes, DMS leadership responded to an invitation from the Society of Applied and Industrial Mathematics by providing an open letter to the DMS community on its funding policies for the institutes. Because it has been published in full in *SIAM News*, <http://bit.ly/1W29rhS>—we published—a portion on the *Amstat News* website at <http://magazine.amstat.org>. The reaction of SIAM President Pam Cook can be viewed here <http://blogs.siam.org/feedback-solicited-on-dms-mathematics-institutes-update>.

On **STATtr@k** this month, three fellows from the **Data Science for Social Good (DSSG)** program offer advice and respond to questions about their experiences, views on data science, and future plans. Visit <http://stattrak.amstat.org>.

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 people news section of the October issue, we spelled Chaitanya Baru's name incorrectly. It has since been updated online. Visit <http://magazine.amstat.org/blog/2015/10/01/people-news-for-october> for details.

In the article "Statistics Degrees Continue Strong Growth," the colors on the figures were incorrectly labeled. The red line represents master's degrees and the blue line represents bachelor's degrees. Visit <http://bit.ly/1jJTr2J> for the correct charts.

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STATS 101: Making Statistics Interesting for Students in Their First Course

Most of us became statisticians because we knew statistics is an exciting and stimulating profession—one in which curiosity and initiative intersect and we can make a difference in almost any industry that sparks our passion. But how many times have we been at a social event where someone asked us what we do for a living? When we replied “statistician,” we almost certainly got “The Look.” You have seen this look many times! It’s the look that says, “There is no way I could ever do *that* for a living.” And it’s the look that is almost always followed by stories of an incredibly boring or outrageously difficult high-school or college statistics class.

To address this all-too-often negative perception of our profession and help ensure that many students’ sole encounter with statistics is a more pleasant experience, Dick De Veaux accepted a homework assignment: He and his committee are creating “Stats 101.” It’s dynamic, relevant, real-life case studies for use as teaching examples, a kind of life raft for instructors that the ASA will offer to schools and universities.

Too often, the person asked to teach that introductory course in a nonstatistics program such as psychology, medicine, engineering, or business is someone relatively early in their career. They may have little or no hands-on experience actually conducting a data analysis. They may rely primarily on a textbook and present statistics as a set of formulas and procedures.

Dick and his team are gathering exciting examples and describing the process of looking at and learning from the data. They’ll capture the students’ interest with the kind of detective work many of us have learned to do and that makes our jobs so relevant and interesting. Read on to learn more about what Dick has in mind.

What do you hope to accomplish with STATS 101? Who do you think will be most interested in it?

As we know, a huge number of introductory statistics classes, particularly in nonstatistics departments, are being taught not only by people who don’t have PhDs in statistics, but often by people who have neither taken a course nor worked in statistics. These instructors have had to learn statistics “from the book”—sometimes just before their students—and have never had the experience of carrying out a statistical analysis on a real problem. So, we’re developing a series of about 10 case studies that will show statistics in “action,” solving real problems and how all those techniques taught in intro stats work together. We’re hoping these will give the instructors not only a sense of how statistics is practiced in the real world, but also some extra examples to use in class. Our target audience is anyone teaching an introductory statistics course who has no training or experience in our field.

Tell us about the content. What principles will you include, and will you present them in a unique way?

There’s really nothing new here. The Data and Story Library (DASL, <http://lib.stat.cmu.edu/DASL>) did something similar nearly 20 years ago. What we’re hoping to do is provide fewer, but deeper, stories and show how all the techniques one learns in an intro statistics course are actually used. Some of the studies will go further than the typical intro stats techniques—using multiple regression or logistic regression, for example—which will give the instructors a sense of where the intro course leads, as well.

Why did you take up this challenge? Who are your partners, and what interests do they bring?

A wonderful independent schoolteacher, Joe Cleary of the Loomis-Chafee school, lives part of the year in Williamstown, where I teach. I didn’t know him, but he came up to me one day and said he was using my AP book and confessed he really didn’t know much about statistics other than what he’d learned from the textbook. He asked if he could “shadow” me for a day or two and see what I really do. I thought it was a really great idea. After spending the day watching me do some data analysis he said, “You have to show this stuff to other high-school teachers. Now I see why you care about things that I didn’t think were important and don’t really care about some



David Morganstein



Dick De Veaux

Unfortunately, many people who had a single course in statistics came away with the impression that it is primarily about formulas and theory.

MORE ONLINE
View the STATS101 resources page at <http://community.amstat.org/stats101/home>. The committee welcomes your review and comments.

things that I did.” So, we developed a workshop for high-school teachers to give them some experience with complex data sets using both traditional and data mining techniques so they could really see what statisticians do today.

My colleagues for these case studies are Dave Bock, retired from Ithaca High School; Nick Horton of Amherst College; Danny Kaplan of Macalester College; Julie Legler of St. Olaf College; and Deb Nolan of Berkeley. They are all wonderful teachers with many years of experience who know the value of in-depth applications for motivating students in both introductory and AP Statistics.

Can you give us a preview of some of the case study topics?

We tried for a mix of applications. We have examples that range from a look back at the famous butterfly ballot of 2000 to examining patterns of bike use in the Washington, DC, bike-share system to modeling how likely your next flight is to be delayed. In each case, the choice of example has been based on availability of data, pedagogical impact, and general interest.

How is STATS 101 different from the “usual” introductory course?

Let me be very clear: This is not a “course.” There are many interesting introductory courses out

there. We’re just trying to provide some examples for instructors who haven’t had the benefit of doing lots of statistical analysis to both give them some motivation and context and possibly provide some real-world examples for their students. As one of my colleagues in operations research who had to teach intro stats once said to me, “You make the course really interesting, but it’s unfair because you have all these great examples.” We’re trying to level the playing field just a bit by putting some on the web.

Will there be any video included?

We’re hoping to eventually have some videos going through the examples, as well, but that’s getting ahead of ourselves a bit. We first need to finish the case studies.

What do you consider as modern methods for teaching statistics, improvements over the traditional?

As we all know, statistics in practice is done using computers with some sort of statistical package, whether that be R, SAS, Minitab, JMP, or something else. I’ve never seen anyone in industry using statistics in their job computing summary statistics on a calculator or drawing a histogram by hand. Yet, we spend time in the introductory course teaching some of these skills. With students going through the Common Core, most of the beginning part of the traditional intro stats course will soon be redundant. We need to get on to the exciting parts of modern statistics—building complex models; simulation and resampling for inference; and discussing causation, reproducibility, and data collection in the Internet age.

Unfortunately, many people who had a single course in statistics came away with the impression that it is primarily about formulas and theory. We believe statistics is a vibrant profession because it is primarily about practice and application. We’re hoping to provide instructors with exciting, interesting examples that will make the subject more real to them and help make their teaching come alive and be more attractive and stimulating to their students.

Will you touch on Big Data in any way?

In a way, yes. We hope these examples provide a precursor to statistical thinking and get instructors and their students thinking about statistics as “problem-solving.” We want people to see statistics as part of the solution when confronted with big unstructured problems. All the data sets are “real,” and most are “modern” in the sense that they’re the kind of data now routinely collected.

The bike-use data are a great example. As people return bikes, several things are sent to the database—the station the bike was taken from, the destination station, demographic information on the user, and the length of time the bike was out. If you’ve ever used a system like this, you know one of the big problems is that too many stations are either empty—so no bikes are available—or full—so you can’t leave the bike. I’ve been late to a meeting because I couldn’t find a place to put the bike. How can we help the city do a better job at placing bikes and figuring out how large the stations need to be?

Are you hoping students who see these examples will “jump ship” and take up statistics?

I’m always hoping students will

jump ship and study more statistics, and from what I see across the country, it's happening even before we wind up posting these examples. I'm just hoping these provide some help for the instructor who feels a bit overwhelmed trying to understand a subject with which he or she has no real world experience. If we can help them understand what it is statisticians really do and how we think, I'll be thrilled.

Dick and his committee are storing their materials at <http://community.amstat.org/stats101/home>. They welcome your review and comment. If you have any reactions, suggestions, or just feel supportive, contact Dick at deveaux@williams.edu.

David Morganstein

ASA Board Approves Expansion of ASA's Science Policy Efforts

Seeking statistician to serve as science policy fellow

At its August meeting, the ASA Board of Directors approved a new position to amplify its science policy efforts. The science policy fellow—to serve a one- to two-year fellowship—will work with the ASA director of science policy to raise the profile of statisticians in policy-making and advocate on behalf of the statistics community.

Modeled after fellowship positions at sister societies (e.g., American Astronomical Society, American Chemical Society, Geological Society of America), the fellow will be a statistician based at the ASA headquarters in Alexandria, Virginia, who will be expected to initiate and lead new advocacy projects in addition to contributing to current efforts. The fellowship, or “rotator,” model for the new position was chosen because of its potential to increase the number of statisticians experienced in science policy matters. Such fellows of sister science societies often go on to related positions in the Washington, DC, area.

Please watch ASA communications for a call for applicants. Questions and interest can be directed to Director of Science Policy Steve Pierson: pierson@amstat.org.



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The ASA

Fellow Award

2015 UPDATE

Stephanie Shipp, Chair, ASA Committee on Fellows

The ASA's 62 new fellows were honored August 11 during the Joint Statistical Meetings in Seattle, Washington. The new fellows are from 24 U.S. states, the District of Columbia, and six other countries. Fellows are recognized for outstanding professional contributions to and leadership in statistical science. See the *Amstat News* October issue (<http://bit.ly/1Lu47go>) for a list of the new ASA fellows.

ASA fellows are recognized for their accomplishments. To be honored, nominees must have established a reputation in the profession *and* made outstanding contributions to statistical science. The Committee on Fellows evaluates candidates' contributions to the advancement of statistical science—requiring evidence of their innovation, leadership, and impact—and their contributions to the profession and society at large. Under ASA bylaws, the Committee on Fellows can elect up to one-third of one percent of the membership as fellows each year.

The fellows committee is composed of nine members, with three each from academia, government, and industry. Committee members serve a three-year term. Starting in early March every year, each member of the committee begins to read the applications, assigns their individual scores, and submits the scores to the chair. The chair normalizes the individual scores and then ranks the applicants by the average score. This provides a starting point for the discussion when the committee meets in April to select the fellows.

Table 1—Number and Distribution of ASA Fellow Awards by Employment Sector by Year, 2005–2015

Year	Employment Sector (% of Membership)			Total
	Academe* (55%)	Business/Industry* (35%)	Government* (10%)	
2005	38 (67.9)	8 (14.3)	10 (17.9)	56
2006	50 (83.3)	5 (8.3)	5 (8.3)	60
2007	37 (62.7)	11 (18.6)	11 (18.6)	59
2008	32 (60.4)	13 (24.5)	8 (15.1)	53
2009	36 (63.2)	15 (26.3)	6 (10.5)	57
2010	43 (81.1)	5 (9.4)	5 (9.4)	53
2011	45 (77.6)	8 (13.8)	5 (8.6)	58
2012	37 (77.1)	7 (14.6)	4 (8.3)	48
2013	41 (69.5)	11 (18.6)	7 (11.9)	59
2014	44 (68.8)	15 (23.8)	4 (6.3)	63
2015	50 (80.6)	10 (16.1)	2 (3.2)	62

*Distribution of membership in 2015; 26% of members do not identify their employment sector on the ASA's demographic information form.

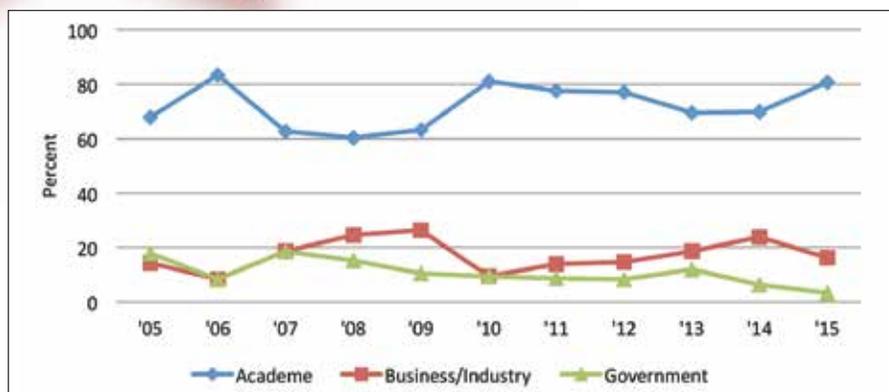


Figure 1: Percentage of ASA fellows awarded by employment sector, 2005–2015

This article continues the tradition of providing a descriptive analysis of the ASA fellows and adds data for the 103 nominees and 62 fellows in 2015. Data are presented by employment sector and gender.

Employment Sector

In 2015, the percentage of ASA members in each employment sector was 55% academe, 35% business/industry, and 10% government. The number of ASA fellow awards given by employment sector for the most recent 11 years is presented in Table 1 and Figure 1. In 2015, 81% of the new fellows are from academe, 16% are from business/industry, and 3% are from government.

The percentages of fellows awarded by employment sector relative to the percentages of ASA membership are shown in Figure 2, which shows that academics are nominated at a higher rate and business/industry members are nominated at a consistently lower rate relative to their respective proportions of membership. Government nomination rates have fluctuated the most in relative terms, in part due to the smaller proportion of members.

The yearly number and percentage of fellow nominations in each employment sector are shown in Table 2. The 103 nominations received in 2015 are close to the average of 101 nominations submitted between 2005 and 2015. The number and percentage of nominations from academe remained high in 2015, while both the number and percentage of nominations from government were low.

2015 ASA Committee on Fellows Members

Stephanie Shipp (chair), *Social and Decision Analytics Lab, Virginia Bioinformatics Lab at Virginia Tech, and National Institute of Standards and Technology (retired)*

Jeri Mulrow, *National Science Foundation*

Estelle Russek-Cohen, *U.S. Food and Drug Administration*

Sudipto Banerjee, *University of Minnesota*

Michael Larson, *The George Washington University*

J. Jack Lee, *MD Anderson Cancer Center*

Susan Hinkins, *NORC*

Mingxui Hu, *Takeda Pharmaceuticals*

Keith Rust, *Westat*

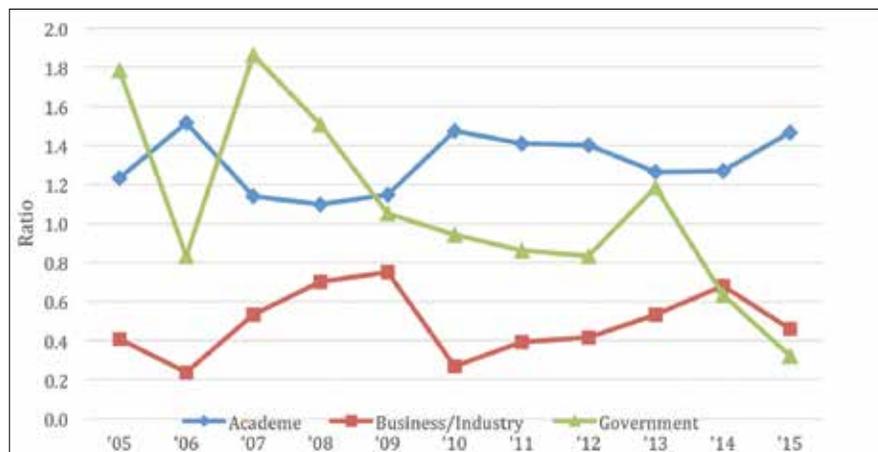


Figure 2: Percentage of fellows awarded by employment sector relative to the percentage of ASA membership in that sector by year

Table 2—Number and Percentage of ASA Fellow Nominations by Employment Sector by Year, 2005–2015

Year	Employment Sector (% of Membership)			Total
	Academe* (55%)	Business/Industry* (35%)	Government* (10%)	
2005	51 (57.3)	22 (24.7)	16 (18.0)	89
2006	81 (73.0)	19 (17.1)	11 (9.9)	111
2007	79 (65.8)	22 (18.3)	19 (15.8)	120
2008	60 (64.5)	18 (19.4)	15 (16.1)	93
2009	59 (62.1)	23 (24.2)	13 (13.7)	95
2010	71 (72.4)	13 (13.3)	14 (14.3)	98
2011	76 (72.4)	18 (17.1)	11 (10.5)	105
2012	62 (75.6)	14 (17.1)	6 (7.3)	82
2013	71 (71.7)	15 (15.2)	13 (13.1)	99
2014	86 (72.9)	24 (20.3)	8 (6.8)	118
2015	78 (75.7)	17 (16.5)	8 (7.8)	103
Average	70 (69.4)	19 (18.5)	12 (12.1)	101

*Distribution of membership in 2015; 26% of members do not identify their employment sector on the ASA's demographic information form.

Year	Employment Sector		
	Academe	Business/ Industry	Government
2005	74.5	36.4	62.5
2006	61.7	26.3	45.5
2007	46.8	50.0	57.9
2008	53.3	72.2	53.3
2009	61.0	65.2	46.2
2010	60.6	38.5	35.7
2011	59.2	44.4	45.5
2012	59.7	50.0	66.7
2013	57.7	73.3	53.8
2014	51.2	62.5	50.0
2015	64.1	58.8	25.0
Average	59.1	52.5	49.3

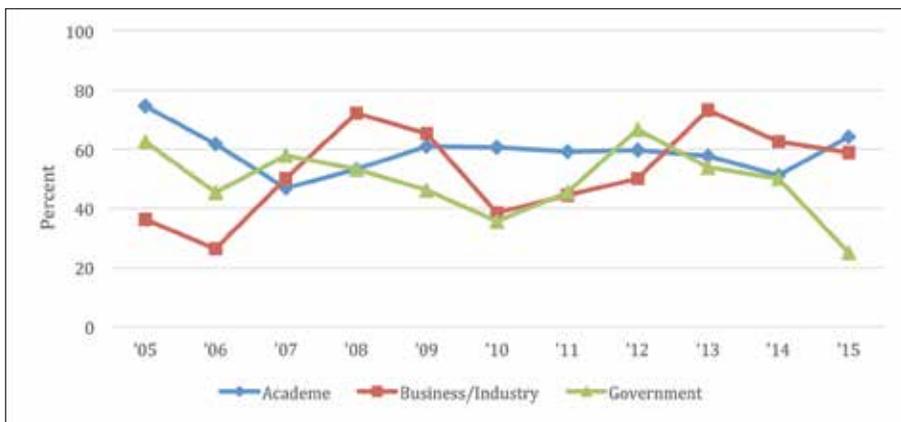


Figure 3: Percentage of successful ASA nominations by employment sector by year, 2005–2015

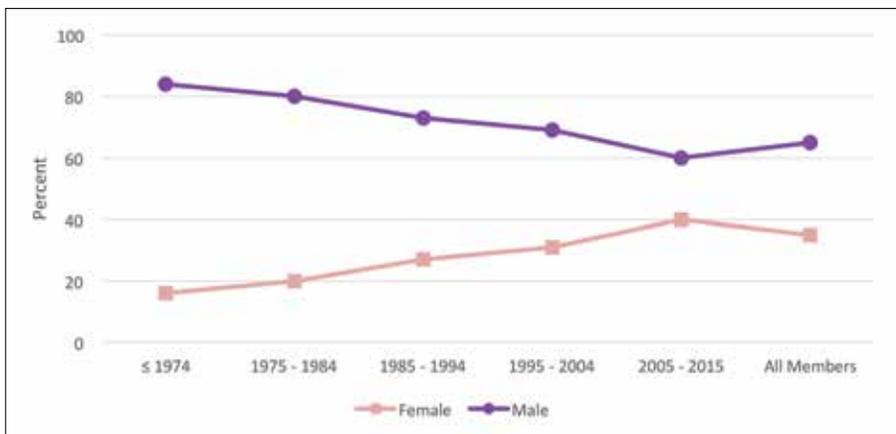


Figure 4: Percentage of current ASA members by gender by year of joining the ASA

One question of continuing interest is the rate of success for the nominations in each sector. As shown in Table 3 and Figure 3, the success rate of nominations submitted from the government sector was below average in 2015. The success rate for academe and business/industry was above average in 2015.

Gender

Table 4 and Figure 4 show the current ASA membership by gender and year of joining the ASA (or, if membership lapsed, rejoining the ASA). The summary is based on available data; more than 15% of ASA members do not enter their gender on their membership form. Among the current members who provide data, there is an increasing trend over time in the proportion of female members.

The number and percentage of ASA Fellow nominations by gender in each year from 2005 through 2015 are presented in Table 5. The number and percent of female nominations have varied since 2005, with a slight increase in recent years.

The number and percentage of ASA fellow awards from 2005 through 2015 are presented by gender in Table 6, and the percentages are charted in Figure 5. There has been a slight decline in the percentage of males and slight overall increase in females, although the numbers and percentages vary each year.

Among nominees, the chance of success has generally been higher for females in the range of years summarized (Table 7 and Figure 6).

Submitting a Nomination

The ASA Fellow Award is a significant recognition of contributions to the statistics profession. The nominee may be worthy of being an ASA fellow, but the nomination

Table 4—Percentage of ASA Membership by Gender and Year of Joining		
Year Joined ASA	Female	Male
≤ 1974	16	84
1975–1984	20	80
1985–1994	27	73
1995–2004	31	69
2005–2015	40	60
All Members	35	65

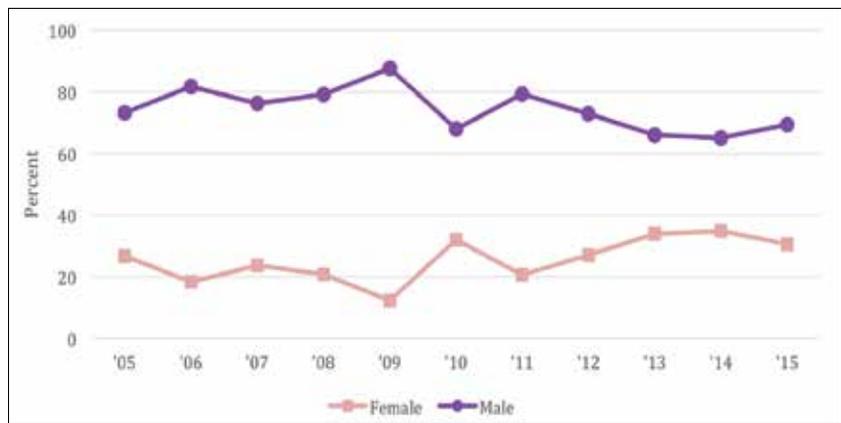


Figure 5: Percentage of ASA Fellow awards by gender by year, 2005–2015

Table 5—Number and Percentages of ASA Fellow Nominations by Gender by Year, 2005–2015			
Year	Female	Male	Total
2005	24 (27.0)	65 (73.0)	89
2006	25 (22.5)	86 (77.5)	111
2007	22 (18.3)	98 (81.7)	120
2008	16 (17.2)	77 (82.8)	93
2009	12 (12.6)	83 (87.4)	95
2010	24 (24.5)	74 (75.5)	98
2011	19 (18.1)	86 (81.9)	105
2012	19 (23.2)	63 (76.8)	82
2013	31 (31.3)	68 (68.7)	99
2014	32 (27.1)	86 (72.9)	118
2015	34 (33.0)	69 (67.0)	103

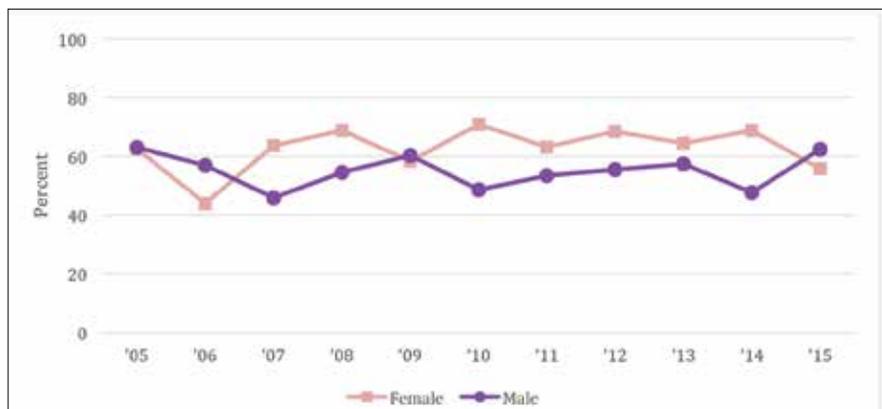


Figure 6: Percentage of successful ASA Fellows nominations by gender by year, 2005–2015

package must convince the committee of this. Both the nomination and letters of support should highlight accomplishments and provide evidence of impact. A long nomination package is not necessarily better, but a well-prepared one is critical to success.

Members of the ASA Committee on Fellows encourage those planning to submit a nomination to review the guidelines and examples on the ASA website (www.amstat.org/awards/fellows.cfm) and to submit the package before the deadline. These guidelines have evolved over time to give everyone a fair chance of being considered. ■

Table 6—Number and Percentages of ASA Fellow Awards by Gender by Year, 2005–2015			
Year	Female	Male	Total
2005	15 (26.8)	41 (73.2)	56
2006	11 (18.3)	49 (81.7)	60
2007	14 (23.7)	45 (76.3)	59
2008	11 (20.8)	42 (79.2)	53
2009	7 (12.3)	50 (87.7)	57
2010	17 (32.1)	36 (67.9)	53
2011	12 (20.7)	46 (79.3)	58
2012	13 (27.1)	35 (72.9)	48
2013	20 (33.9)	39 (66.1)	59
2014	22 (34.9)	41 (65.1)	63
2015	19 (30.6)	43 (69.4)	62

Table 7—Percentage of Successful ASA Fellow Nominations by Gender by Year, 2005–2015		
Year	Female	Male
2005	62.5	63.1
2006	44.0	57.0
2007	63.6	45.9
2008	68.8	54.5
2009	58.3	60.2
2010	70.8	48.6
2011	63.2	53.5
2012	68.4	55.6
2013	64.5	57.4
2014	68.8	47.7
2015	55.9	62.3
Average	62.6	55.1

ASA LEADERS REMINISCE

Mitchell H. Gail

Jim Cochran

In the eleventh installment of the Amstat News series of interviews with ASA presidents and executive directors, we feature a discussion with 1995 president Mitchell H. Gail.

Dr. Mitchell H. Gail is a senior investigator at the biostatistics branch of the Division of Cancer Epidemiology and Genetics at the National Cancer Institute (NCI). He earned an MD from Harvard Medical School and a PhD in statistics from The George Washington University. His work at NCI has included studies on the motility of cells in tissue culture, clinical trials of lung cancer treatments and preventive interventions for gastric cancer, assessment of cancer biomarkers, AIDS epidemiology, and models to project the risk of breast cancer. Gail's current research interests include statistical methods for the design and analysis of epidemiologic studies, including studies of genetic factors, and models to predict the absolute risk of disease. He is also working on methods of calibration and seasonal adjustment for multi-center molecular-epidemiologic studies.

Gail is a Fellow of the American Statistical Association and member of the Institute of Medicine of the National Academy of Sciences. He has received several prestigious awards, including the Spiegelman Award from the American Public Health Association, the Snedecor Award from the American Statistical Association, the Marvin Zelen Leadership Award in Statistical Science from the Harvard T.H. Chan School of Public Health, the Nathan Mantel Lifetime Achievement Award from the American Statistical Association, and the Award for Excellence in Cancer Epidemiology and Prevention from the American Association for Cancer Research and American Cancer Society.



QMitch, thank you for taking time to talk with me. You have what I suspect is a unique distinction among ASA presidents. Several years before you earned your PhD in statistics from The George Washington University, you earned an MD from Harvard Medical School. What motivated you to return to school to work on a PhD in statistics several years after you earned your MD?

AAfter working as a medical intern in at the Peter Bent Brigham Hospital in Boston for one year, I joined the U.S. Public Health Service (USPHS) as a researcher at the National Cancer Institute (NCI). My first project was studying the motility of cells in tissue culture. They moved in a two-dimensional random walk, and I needed statistical methods to characterize their rates of diffusion. John J. Gart at NIH showed me how to perform certain regressions, plotting mean squared cell displacement against time. Three years later, David P. Byar invited me to join his clinical and diagnostic trials section at NCI to work on lung cancer clinical trials and problems in the immune-diagnosis of cancer. These projects required statistical knowledge, and the USPHS paid for some night courses at The George Washington University in DC. At first, I enrolled as a master's student, but before I knew it, I was working with Joseph L. Gastwirth on my PhD thesis. I was lucky to be working in an environment that supported continuing education and where my increasing statistical skills were useful and appreciated.

QThis spring, you received the 24th annual AACR-American Cancer Society Award for Excellence in Cancer Epidemiology and Prevention from the American Association for Cancer Research (AACR) and American Cancer Society. The AACR press release cited a statistical model you developed in the late 1980s for estimating the absolute risk for a white woman of a specific age with specific risk factors to develop breast cancer. What led you to develop this model, which is commonly known as the "Gail model," and what has been the impact of this model?

AOne day, I went to lunch with an NCI collaborator, John J. Mulvihill, who was advising women in a clinic for women at high risk of breast cancer. Many such women thought they had unre-

alistically high risks of cancer because of strong family histories, and John wanted to be able to give them realistic estimates. I was fortunate to be working with other collaborators (Louise A. Brinton and Catherine Schairer) who were familiar with data on breast cancer risk factors from the Breast Cancer Detection and Demonstration Project and with statisticians (Dave P. Byar, Donald K. Corle, and Sylvan B. Green) who knew a lot about relative risk modeling and attributable risk estimation. My contribution was to bring all these tools together to compute absolute, not relative, risk. Absolute risk is the chance that a woman with specific risk factors will develop breast cancer over a defined time interval. Absolute risk has many applications in individual counseling and public health planning.

One of the first uses of the model was to help design a large randomized intervention trial to determine whether tamoxifen could prevent breast cancer. Statisticians at the National Surgical Breast and Bowel Project (NSABP) combined national breast cancer incidence data with the relative and attributable risks from the original model to produce what is now known as the “Gail model,” or the National Cancer Institute’s Breast Cancer Risk Assessment Tool. This model correctly predicted the number of breast cancers that would develop over five years during the Breast Cancer Prevention Trial, which showed that tamoxifen cut breast cancer incidence by half. Unfortunately, tamoxifen also caused some serious side effects, such as strokes and endometrial cancer.

The absolute risks associated with each of the risks and benefits of tamoxifen are needed to help a woman decide whether she stands to benefit from such an intervention. Typically, young women with high breast cancer risks benefit most. Today, there are several good risk models for breast cancer with various strengths and weaknesses, and they are widely used in counseling and for making public health recommendations. NCI’s website for breast cancer risk assessment is visited more than 3 million times per year.

QYou have developed many breast cancer risk assessment tools, including several SAS macros for breast cancer risk assessment that have been designed for different demographic/ethnic groups. What led you and your colleagues to develop different breast cancer risk assessment tools for different demographic groups?

AThe National Cancer Institute’s Surveillance, Epidemiology, and End Results Program (SEER) gathers breast cancer incidence data for racial and ethnic subgroups, and there is considerable variation in the age-specific incidence rates. Therefore, specialized models are needed for various racial and ethnic groups

to provide realistic estimates of absolute risk. Our initial attempt was to combine race/ethnicity-specific SEER rates with the relative and attributable risks from the original Gail model, which was developed from data on white women, to compute race/ethnicity-specific absolute risks. More recently, we have been able to obtain data on relative and attributable risks that are also specific to various racial/ethnicity groups. Fully specific models are available for African-American and Asian-American women, and we are obtaining such data for Hispanic women.

QIn 2012, you served as chair of the Section on Statistics of the American Association for the Advancement of Science (AAAS). What issues did this AAAS section face during your term as its chair?

AThe Statistics Section (Section U) of AAAS was formed in 1962. Jerzy Neyman described the role of the section and stressed the opportunity for interdisciplinary exchange (*Science*, 1962; 138:1080-1083). Several issues related to this tradition come to mind. The first was developing an exciting set of symposia from Section U with broad appeal to the scientific community on topics ranging from “Understanding and Communicating Uncertainty in Climate Change Science” to “Benefits of Randomized Experiments for Science and Society.” A second was nominating and recognizing AAAS fellows for their contributions in statistics and its applications. A third was increasing visibility of Section U and the role of statistics. In coordination with the ASA (and with a big boost from Marie Davidian, former ASA president, and Ron Wasserstein, ASA executive director), we geared up to celebrate the 50th year of Section U and the International Year of Statistics (2013). This cooperation with the ASA has continued, and Section U has grown during a period when overall AAAS membership has not.

QWhat challenge that you faced during your ASA presidency stands out?

AThat would be the immense diversity of interests of ASA members. It seemed to me that one of the challenges of the ASA was to serve such a professionally diverse and talented membership. In my presidential address, I reviewed the contributions of Bradford Hill and Jerome Cornfield to the development of the case-control method and clinical trials. These great statisticians combined the development of innovative methods with deep involvement in collaborations and substantive scientific research and set an example that many of us could try to emulate, regardless of our particular interests or specializations. ■

SNEAK PEEK
Please return to this column next month, when we will feature an interview with 1994 ASA President Ronald L. Iman.

ESRA Award Winner Talks About ‘Bringing the Invisible Superhero of Science to Light’

Morteza Marzjarani



Julie Rehmeyer

The Committee on the Excellence in Statistical Reporting Award selected Julie Rehmeyer as the winner of its 2015 award. Rehmeyer is a professor at St. John’s College in Santa Fe, New Mexico, as well as a contributing editor for *Discover*.

Members of the ESRA committee were especially impressed with the number and breadth of Rehmeyer’s articles. Her work spans two books, recurring contributions to ScienceNews.com and *Discover*, and an array of articles in science- and general-audience publications such as *The New York Times* and *The Washington Post* that help connect the public with science. In particular, the committee pointed to two articles that stood out:

“Equation: Calculating Ballot Bungles Is All About the P -Value,” published online by *Wired*

“Florence Nightingale: The Passionate Statistician,” published on ScienceNews.com by the Society for Science & the Public

What follows is an interview with Rehmeyer.

When did you become interested in statistics?

I’ve actually never taken a statistics course, and it took me quite a while to discover the joys of statistics. I did my graduate work in mathematics at MIT, but I was a dumb kid and only saw the appeal of the purest of the pure mathematics, being a mystic at heart. I sneered at applied subjects like statistics and engineering. My attitude started to change when I designed and built my own house and the engineering I learned to calculate beam sizes and such enchanted me. Using mathematics to *do* something was really cool!

I became a professor of mathematics and the classics at St. John’s College in Santa Fe, New Mexico. St. John’s is a teaching college, and its faculty members have little time for research. I loved the teaching, but eventually found that I missed having my own intellectual and creative work. But at that point, for a variety of reasons, I didn’t see myself doing research mathematics. On a lark, I picked up a statistics book over the summer and had a ton of fun learning statistics. But I ultimately decided to head in the direction of science writing.

What do you particularly enjoy about writing about statistics? How is it different from writing about science?

I wrote the Math Trek column at *Science News* for quite a few years, and I took particular pleasure in finding statistics stories for my column. It felt like I was bringing the invisible superhero of science to light.

On a deeper level, I find it especially meaningful to write about mathematics and statistics because so many people have had wounding experiences with them in school. It gives me such enormous pleasure when someone says, “I read your article, and you know, I just don’t have a math brain and I hate math, but I think I understood your story, and it was pretty fun!”

To me, when people come to believe they’re terrible at math, they’re suffering from a wound that’s ultimately a spiritual one. They’ve been convinced that their ability to find pattern and meaning in the world is somehow fundamentally flawed. The impacts of that kind of wound go far beyond anxiety when it comes to calculating a tip or balancing a checkbook.

In a background way, often unnoticed, it saps people's power, makes it harder for them to access their deepest selves and bring that into the world.

So when someone is able to follow one of my stories and find a bit of joy in it, I hope that wound heals a bit. I hope, in some small way, that it bolsters people's confidence in themselves, and it shows them that the joy and power of mathematics is available for them, too.

Are there special challenges in writing about statistics?

One challenge is that people are often so frightened of it, so as a writer, you have to work especially hard to enter a different mindset and offer handholds along the way.

Another challenge is that statistics is all about uncertainty, and it's easier to tell stories with clear, single outcomes.

I think one of the biggest tools to deal with both those challenges is narrative. Our brains are wired for story, so readers are better able to absorb information that way. And if you can weave the uncertainty into the story, it can acquire a power of its own, rather than merely diluting the power of a tidy result.

What do you think about ESRA?

I'm really thrilled about receiving it. As writers, we often don't see the impacts of our stories. We hear from very few readers, and the ones we hear from are far from representative: They're often those who are outraged. We throw our stories out there and move on to the next, hoping that they're somehow adding up to something.

When I learned I was receiving the award, I was pleased, but I initially had a hard time really absorbing it. But being at the award ceremony, hearing the citation read, seeing the list of people on the committee I didn't know who selected me, receiving my cup—it was really moving for me. It's wonderful to know that people appreciate my work.

Do you have a hero in the discipline of statistics?

Florence Nightingale. My story about her, "The Passionate Statistician," was one especially cited for my award. We tend to think of her as "the lady with the lamp," saving the lives of wounded soldiers through her nursing. But she saved many more lives through her use of statistics, revealing the changes that needed to be made in nursing as a whole. She also did a huge amount of that work while fighting a serious

chronic illness, and since I wrote many of my own statistics stories while dealing with a serious chronic illness, that was especially moving to me.

What have you done since you won the award?

I'm writing a book at the moment, a memoir about the science and politics of poorly understood illnesses. I was terribly ill with chronic fatigue syndrome for many years, eventually so sick that I was paralyzed much of the time, and I eventually discovered that for me, the central problem was a hypersensitivity to mold. Science hasn't served chronic fatigue syndrome patients well, and the experience has affected my relationship to the institutions of science quite significantly. On the surface, this is far removed from statistics, but some of the questions at its heart are quite similar: How do we make sense of the evidence our bodies give us? How do we assess uncertainty? How do we make good decisions in the face of that uncertainty?

I'm also a Scripps environmental journalism fellow at the University of Colorado, Boulder. I get to have the run of the university and take any class I please, but I have no responsibilities. Pretty sweet gig!

What are your other passions?

Recovering my health enough that I'm able to exercise again is an enormous thrill, so I'm loving biking and hiking and running and swimming. I take huge pleasure in my dog, Frances. I got married two years ago, and I still feel very much like a newlywed (and also like I can hardly remember life before him). I built my own straw bale house on 12 acres of streamside land outside Santa Fe, New Mexico, and I feel very connected to my house and land. ■

MORE ONLINE

Do you know a member of the media eligible for the Excellence in Statistical Reporting Award? Nominations are being accepted until March 1. Visit <http://bit.ly/1Pvosn8>.

Awards

The ASA's extensive awards program recognizes statisticians who have made outstanding contributions through research, teaching, consulting, and service to the association and statistical profession.

The deadlines to nominate a colleague for many of these awards occur from December to March.

Visit www.amstat.org/awards/awardsscholarships.cfm and nominate a colleague today!



Teaching Statistics and Data Science at a Community College

Statistics and data science degrees are some of the fastest-growing undergraduate programs in the country. We wanted to know if this growth has affected teaching statistics at community colleges and if there are any relevant changes professors have seen or experienced.

WEST VALLEY COLLEGE Northern California



Rebecca Wong has taught mathematics and statistics at West Valley College for more than 20 years. She enjoys designing activities to help students actively explore statistical concepts and encouraging students to apply those concepts to areas of personal interest.

Describe the statistics course(s) your college offers and any recent changes you've made.

At West Valley College, we offer an elementary statistics course that fulfills mathematics and quantitative reasoning transfer requirements for our students. Our department offers a course aligned with the GAISE standards, emphasizing conceptual understanding, interpretation, working with real-world data, and the use of technology.

What do you like most about teaching statistics in the community college setting? What challenges do you experience that might be unique to community colleges?

Statistics is one of my favorite classes to teach. It is so easy to bring students' interests into the classroom and find topics they find engaging. For example, one of my students last semester has a YouTube channel. She was excited to learn how to understand all the data analytics YouTube sends her about her viewers. As part of a class project, another student interviewed an anthropologist and was surprised to learn how much statistics played a part in the work he did. Based on the interview, this student was able to expand her professional network and find an internship opportunity. Stories like this aren't uncommon in my statistics course. There is an excitement and interest in my statistics course that is not replicated in my algebra or calculus courses quite as easily.

Teaching statistics at a community college does have its unique challenges. I, like the majority of my colleagues, have degrees in mathematics—not statistics. I have to depend on conferences, networking, and reading to expand my background in the subject area. In

mathematics, I understand the depth and breadth of the subject area and the connections between the various courses in the sequence of study. Not having the same background in statistics makes it difficult to advise students who might consider statistics as a major. In addition, community colleges offer only one course in statistics, limiting the ability of students to explore statistics as a possible major.

Describe an emerging trend you have noticed related to teaching statistics in community colleges.

One trend at the community colleges has been the development of a “pre-statistics” course. Currently, community college students (based on placement test scores) have to take several levels of algebra before taking statistics. Rather than repeating an algebra curriculum, pre-statistics is a one-semester course that focuses on those skills that students need to be successful in the elementary statistics course. We have been offering the pre-stats course for one year, and it has been successful in accelerating students through their transfer-level mathematics course.

CAPE COD COMMUNITY COLLEGE

West Barnstable,
Massachusetts



Mary Kehoe Moynihan chairs the ASA/American Mathematical Association of Two-Year Colleges (AMATYC) Joint Committee and is an active member of the New England Mathematical Association of Two Year Colleges and AMATYC. She has taught mathematics and computer science at Cape Cod Community College since January 1979.

Describe the statistics course(s) your college offers and any recent changes you've made.

Elementary Statistics at Cape Cod Community College is a non-calculus-based introduction to statistics geared toward non-STEM majors. It fulfills the three-credit mathematics graduation requirement.

Are you seeing increasing enrollment in your statistics classes, and, if so, what do you think is driving it?

Statistics is a “service course” for us—our STEM majors don’t traditionally take it. We’ve seen a significant increase in our enrollment largely due to other departments such as psychology and nursing recommending or requiring their majors to take elementary statistics.

What do you like most about teaching statistics in the community college setting? What challenges do you experience that might be unique to community colleges?

I love that when a student in our statistics course asks when he or she will ever use statistics, the honest answer is “every day.”

A challenge I face at the community college is that many students simply don’t have the resources to buy the materials required for many statistics courses. I currently use the materials from a free online course. Students can rent a calculator from our library, and the statistical software I’m using costs less than \$20.

Describe an emerging trend you have noticed related to teaching statistics in community colleges.

The introductory statistics course is the most volatile of the courses taught by the mathematics department right now. There are pressures, expectations, and changes coming from many directions.

From the developmental mathematics perspective, many schools are “bundling” developmental mathematics and statistics into a pathway designed to help non-STEM students succeed in a college-level mathematics course. For example, the goal of both the Carnegie Foundation’s Statway and the statistical reasoning pathway in the Dana Center’s New Mathways project is to improve student success in a college-level statistics course. States have tired of high-school graduates spending years in developmental mathematics courses required by many colleges as the prerequisite to college-level mathematics courses such as statistics.

This epidemic was the focus of the first National Summit on Developmental Mathematics held just before the 2013 AMATYC conference in Anaheim. In my

state (Massachusetts), funding of the community colleges is now directly linked to student success and graduation rates. Statistics has most often been the focus of these acceleration/student success projects, with some advocates arguing that little material in the traditional algebra prerequisite is actually needed in a statistics course.

From the Common Core perspective, a significant number of topics we include in introductory statistics will be taught in K–12. If the Common Core is implemented successfully, it will dramatically affect the topics covered in the introductory statistics course.

Some prominent members of the statistics education community believe statistical inference should be introduced with bootstrap confidence intervals and randomization-based hypothesis tests, rather than the traditional parametric techniques. Recent trends have increased the emphasis on inferential statistics in the introductory statistics course. Therefore, fundamentally changing the way inference is taught would substantially change the course.

There is a temporary ASA committee reviewing the *GAISE College Report*. This workgroup is updating the report, with recommendations expected as soon as the end of 2015. The *GAISE College Report* was originally published in 2005 and has been influential in shaping the modern statistics course.

Finally, the projection of unfilled jobs caused by the explosion of Big Data analytics and data science has many wondering if our non-STEM introductory statistics courses might provide fertile ground for future statistics/data science majors. Traditionally, most majors begin their program with calculus, and most introductory statistics

MORE ONLINE
The Guidelines for Assessment and Instruction in Statistics Education (GAISE) College Report has been influential in shaping the modern statistics course. You can download the report here: www.amstat.org/education/gaise.

courses are non-calculus based. Still, as we look for hundreds of thousands of professionals trained in Big Data analytics, exposing introductory statistics students to some of the basic concepts of data science might inspire students to explore the field.

Note that several of these trends are pulling the introductory statistics course in different directions. The pathways projects often minimize the mathematics prerequisite for the course and the traditional algebra topics in the paired courses, while the goal of the Common Core is to prepare college-ready students who have already achieved many of the learning outcomes in the current college-level introductory statistics course. Meanwhile, an effort to attract statistics/data science majors would target students with a strong mathematics background.

Job analysts predict statisticians will be in high demand, and statistics will be the “hot” job over the next decade. I believe the modern introductory statistics course will adapt to these influences, providing many challenges and opportunities for all faculty teaching the course.

Characterize the students who tend to take statistics at your campus/college.

Almost every student is taking elementary statistics to fulfill their mathematics general education requirement: “I’m taking the course because it’s required for my degree.”

What advice do you have for other statistics instructors at community colleges?

A modern statistics course is most likely radically different from any statistics course you took as a student. Try to keep up with the most recent recommendations for introductory statistics from the professional societies, including the Mathematical Association

of America, ASA, and AMATYC. There are free webinars and resource pages available on their websites. I just Googled “statistics webinars teaching resource” and found valuable links, including the AMATYC statistics resources page the ASA/AMATYC Joint Committee oversees.

What advice do you have for community college students regarding statistics and or data science?

Do the homework. You need to practice your skills and carefully read assigned material to master common statistical procedures, gain a conceptual understanding of statistics, and hopefully develop a statistical way of thinking.

MONTGOMERY COLLEGE

Germantown, Maryland



Brian Kotz is a mathematics and statistics professor at Montgomery College in Germantown, Maryland. A statistics educator for more than 20 years, he was appointed to the ASA/AMATYC Joint Committee in 2012 and has authored numerous print and video resources.

Describe the statistics course(s) your college offers and any recent changes you’ve made.

We offer a general introductory statistics course and a business/economics statistics course. Both courses have been using open resources lately to complement textbook resources, and some sections are completely using open resources on a trial basis. Many sections of the introductory statistics course are working with simulation-based inference this semester, and a biostatistics course is being considered for development.

Are you seeing increasing enrollment in your statistics classes, and, if so, what do you think is driving it?

Yes. Some of that is due to the increase in overall enrollment at our college. However, many students are choosing to take statistics (as opposed to other courses in our mathematics/statistics department) to meet their mathematics requirements for graduation and quite a few programs require or strongly recommend statistics for their degree.

What do you like most about teaching statistics in the community college setting? What challenges do you experience that might be unique to community colleges?

I like that we are serving and reaching a community of dedicated learners who, for various reasons (e.g., finances, job, family), either cannot or choose not to immediately participate in a four-year college environment. This population of learners is quite large in number, at least in our community.

Describe an emerging trend you have noticed related to teaching statistics in community colleges.

I think the GAISE standards really helped codify expectations and practices and guide instruction in

both two-year and four-year colleges. Ultimately, I want the partnership between the ASA and AMATYC to remain strong; to continue to evolve; and to develop in meaningful ways regarding curricula, professional development, open technology resources, and so on.

What advice do you have for other statistics instructors at community colleges?

The opportunities for professional development are many, and the ASA statistics education community is a particularly caring, engaged, and helpful group. Do not hesitate to contact them (e.g., authors, colleagues at a nearby four-year college, ASA section members). They want to work with you!

What advice do you have for community college students regarding statistics and/or data science?

I tell students that whether they plan to use what they have learned to better serve the public, improve their business, or serve as the foundation for the next statistics course they will take upon transferring to their four-year college, they are better informed citizens of our community having been introduced to the discipline of statistics. I also tell them they have the kernel of a very in-demand skill set and encourage them to stay in touch and consider pursuing further coursework in statistics or data science, regardless of whether it is required of them.

COLLEGE OF THE CANYONS Santa Clarita, California



Monica Dabos is a statistics instructor at College of the Canyons. Recently, the National Science Foundation funded her initiative, TANGO Stat Ed (Training A New Generation of Statistics Educators), to improve the teaching and learning of statistics at the two-year community college level.

Describe the statistics course(s) your college offers and any recent changes you've made.

College of the Canyons has one college-level statistics course, Math 140 "Intro to Statistics." The college has also developed a new statistics preparation course for non-STEM majors called Math 075, "Intermediate Algebra for Statistics." After successfully completing Math 075, non-STEM students can enroll in Math 140 and complete all the transfer math requirements. We are considering offering another statistics course that addresses more advanced topics, but there are some state regulations limiting what we can offer.

Are you seeing increasing enrollment in your statistics classes, and, if so, what do you think is driving it? Also comment on any emerging trends you have noticed related to teaching statistics in community colleges.

Demand for statistics courses at the community college level has

increased dramatically, and we expect this trend to continue. For example, College of the Canyons' pre-statistics and statistics offerings have grown from 59 in 2012 to 106 currently. California, the largest college system in the United States with 112 community colleges, is experiencing a similar increase. In California, statistics is taught within mathematics departments; however, this adds another challenging dimension because a master's degree or a PhD in statistics does not qualify an individual to teach statistics (a mathematics degree is required).

Lack of support, combined with little formal training in statistics, are two possible reasons why instructors are reluctant to teach statistics, despite the availability of sections. Technology is another obstacle that faculty, especially part-time instructors, encounter. Many community colleges lack the resources required to implement new teaching methodologies. Using simulations or data sets that have many variables and more than 20 data points are difficult to implement without access to appropriate software and training.

What do you like most about teaching statistics in the community college setting?

I love teaching statistics at the community college level because priority is given to teaching and helping students succeed. I also have the opportunity to shine a light on statistics as a possible career choice when many students are still defining their educational goals.

What advice do you have for other statistics instructors at community colleges? Any advice for community college students regarding statistics (and/or data science)?

The best advice for instructors I can offer is to get connected! In isolation, it is easy to feel lost and/or discouraged when

students do not understand statistical concepts. A few programs are emerging to address this and they are worth mentioning here. CAUSEweb.org offers free webinars. The TANGO Stat Ed program and ASA Member Initiative program both offer mentors and regional hubs for developing and strengthening statistical knowledge of instructors teaching statistics at community colleges. Whether you are an instructor who has experienced success in teaching statistics or an instructor who would like help developing better teaching tools, getting connected is the answer. Get connected, get connected, get connected. This is my mantra.

For students, I'd tell them to dive into statistics to see how relevant it can be to their daily lives and career opportunities. Most importantly, I'd promise them that, with the right instructor, statistics could actually be fun!

AUSTIN COMMUNITY COLLEGE Austin, Texas



Mary Parker teaches mathematics and statistics at Austin Community College and mathematical statistics at The University of Texas at Austin. She participated in writing curriculum and teaching in the Carnegie Foundation's Statway project and the Dana Center's New Math Pathways project.

Describe the statistics course(s) your college offers and any recent changes you've made.

We teach elementary statistics from the book *Basic Practice of Statistics*, 7th edition. Just this year, we added ANOVA as a required chapter, so we now cover chi-squared tests, inference on regression, and ANOVA. To do this, we are de-emphasizing calculations with a hand-held calculator after one-sample t -tests—particularly de-emphasizing calculations of SE. We made several other changes to increase the emphasis on concepts.

We also have worked with both the Carnegie Foundation offering Statway and the Dana Center offering New Math Pathways StatPath.

Are you seeing increasing enrollment in your statistics classes, and, if so, what do you think is driving it?

Beginning around 2011–2012, we saw substantial increases in enrollment. More disciplines, particularly health sciences disciplines, began to specifically require statistics.

What do you like most about teaching statistics in the community college setting? What challenges do you experience that might be unique to community colleges?

The small classes (36 or fewer) are helpful for engaging students. There are a variety of challenges, which are mostly related to students being overburdened with work and family obligations and sometimes-unrealistic expectations of the amount of work a college course takes.

Characterize the students who tend to take statistics at your college.

We have significant numbers from health sciences and business studies, but also students from many other areas in which the faculty think their students will benefit more from a statistics course than college algebra. We have a substantial number of returning students, who need statistics as a prerequisite for graduate work in various fields.

What advice do you have for other statistics instructors at community colleges?

Emphasize thinking about data and the conceptual ideas. Statistics students (in courses offered in math departments) usually think the main characteristic of a correct answer is to match the numbers in the solution key. Work on moving them toward describing what information the data is giving about a real-life question of interest.

If your text supports discussion of data ethics, embrace that. It is some of the most engaging material to my students. I have it on a discussion board forum available most of the semester and try to stay out of the conversation as much as reasonable to encourage them to discuss the ethics of various situations with each other.

What advice do you have for community college students regarding statistics and/or data science?

Large data sets are increasingly available, and people are needed to extract useful information from them. In your statistics classes, pay careful attention to what techniques are useful to answer what sorts of questions and why. Learn to use a flexible professional statistical package. ■

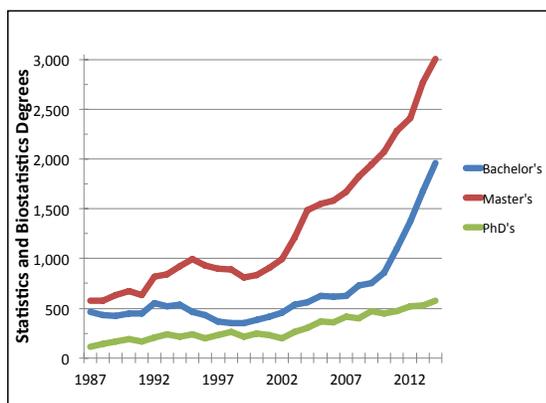
TAS Special Issue: Undergraduate Curriculum

Nicole Lazar

The November 2015 issue of *The American Statistician* is a special issue on statistics and the undergraduate curriculum. You will read about innovations in statistics education beyond the first introductory course. The authors of these papers tackle a wide range of questions that are central to the way in which we think about our undergraduate programs. What should the second course look like? How should we train our majors? Can we expose undergraduate students to more advanced concepts? To larger data sets? And how can we tell if any of this is working?

Several broad themes addressed in the 2014 ASA Curriculum Guidelines for Undergraduate Programs in Statistical Science (www.amstat.org/education/curriculumguidelines.cfm) are included in this special issue. An overview of “where we are” by **George Cobb** is sure to generate discussion. Indeed, you can find an online discussion of his paper, featuring comments from 19 leading thinkers and educators (along with his rejoinder), as a supplement to the print edition. Other papers focus on computation, visualization, simulation, data science, theoretical statistics, and program assessment.

Now is a time of great and rapid change for our discipline in general, and the effects are being felt at the undergraduate level, as well. Data science, Big Data, and the surrounding hype have all led to increased demand on our courses and programs.



Statistics and biostatistics degrees at the bachelor's, master's, and doctoral levels in the United States. Data source: NCES IPEDS.

The undergraduate major continues to grow, both in the number of programs offering the bachelor's degree and in the number of degrees awarded, which quadrupled between 1987 and 2012. We are

thus at an appropriate juncture to step back, take stock of what we are doing, and think about what we could be doing differently or better.

Guest editors **Jo Hardin** and **Nicholas Horton** have put together a stimulating set of articles from some of the leading researchers in statistics education, who provide thoughtful answers to many of the questions I've raised here. I hope you will find ideas in this issue to improve and reinvigorate your programs and inspire your teaching. ■

ASA Seeks Editor Nominations, Applications

The ASA is seeking editor nominations and applications for the following publications:

Journal of the American Statistical Association, Theory and Methods

CHANCE Magazine

Journal of the American Statistical Association/
The American Statistician, Reviews

Statistics in Biopharmaceutical Research

Nominations and applications for *CHANCE* should be sent to megan@amstat.org. Nominations and applications for *JASA* Theory and Methods, *JASA/TAS* Reviews, and *SBR* should be sent to journals@amstat.org.

Nominations should include the candidate's CV, if possible, and a short statement as to why the person would be an excellent editor of the publication.

Interested persons are encouraged to apply. Applicants should send a CV; the names of three references; and a letter of interest in the position, including a brief statement of your vision for the publication, directions you would pursue, and contributions you would make if selected as editor.

Nominations should be sent by December 11. Applications should be sent by February 5, 2016.



MASTER'S NOTEBOOK

Statisticians in Sierra Leone

Dana Haberling and Jodi Vanden Eng

Getting to Zero

Dana Haberling is a statistician in the Prion and Public Health Office in the Division of High-Consequence Pathogens and Pathology at the Centers for Disease Control and Prevention in Atlanta, Georgia. In January 2015, she spent a month working in Sierra Leone as part of the ongoing Ebola emergency response. She earned her MSPH in biostatistics from Emory University School of Public Health.



As statisticians, we don't often get opportunities to get out in the field. But hey, I work for the Centers for Disease Control and Prevention (CDC), too! I love public health, too! And I think it sounds "fun" to go out, too! So as soon as I could, I put my name in for a deployment to West Africa to be part of the Ebola response.

In real life, I am a "health statistician" and I tend to act something like a consultant to my group at CDC. My division covers many diseases, and so I see many types of data and studies. We're heavily slanted toward epidemiology, but the job really requires a statistician's thinking and a statistical programmer's capabilities. I knew there were a lot of data going around in West Africa and figured I would have something to offer that others did not. That said, for an outbreak, you know going in that you have to be flexible.

The amount of time and effort it takes to get any one person out the door is staggering. On top of my typical week and preparing to have my current projects under control, I needed the following:

- Official permission from my boss
- Training for personal and health safety
- A visa for Sierra Leone
- Plane tickets
- Budgeting paperwork
- Clothing that washes well in the sink and can air dry
- Food, soap, and whatever else I might need
- Any number of arrangements for the life I was leaving behind for 29 days

This is all done with the help of CDCers in Atlanta volunteering to work Ebola administration roles. Two days after Christmas, I boarded a plane for Freetown, Sierra Leone.

Everyone from CDC working in Freetown lived and worked (we took over a conference room for an emergency operations center) in the same hotel. The average day felt a bit like being a freshman again: roll out of bed, load up on a buffet breakfast, walk down the hall, stick my head in a laptop, take quick breaks for ramen or coffee, maybe join happy hour with colleagues (including laptops, work phones, and usually talk of Ebola), have a quick Skype with loved ones, and then work in my room until it was late/early enough to get some sleep in preparation for the next day. Repeat 28 times. The days were long. But, because I was so into the work and on the go, it was a week before I realized just how close to the beach I was.

I ended up as the country data manager and statistician. In many ways, you can imagine what it was like: getting new data, trying to understand and clean it both for regular and ad-hoc analysis, trying to figure out what had been done previously, interpreting hand-me-down code, and wondering how I might be able to improve anything for the next person.

In the beginning, it was a little intimidating to step into the middle of a big production that seemed to be going along just fine without me. But much like being a freshman, I quickly found my place. I got to know other CDC people (some from my own building in Atlanta and others from international offices), the Sierra Leone Ministry of Health staff, and others from different organizations or NGOs.

It eventually became normal to see the doorway guards with bleach water and a thermometer, signing up for a driver if I needed to go out, feeling comfortable with road blocks and check points, getting dinner or takeout before the city-wide curfew of 6 p.m. (thereby avoiding another hotel dinner), and navigating new buildings and meeting protocols.

Several days of my week were spent working at the Ministry of Health. My main task there was pushing to streamline the data acquisition from various districts, each with their own data manager, and helping get a weekly national data set published. We provided both analytical and technical support for their daily count reports; others from our epidemiology team taught the staff how to use mapping software to reproduce what the CDC had been providing.

Statistical work on the ground in Sierra Leone was like working with the cartoon angel and devil on my shoulders: The angel wanted me to examine my data, follow assumptions, and produce organized and beautiful graphics; the devil nagged me to rush and just get something out the door! Professionally, this was the biggest challenge. And everything required patience—patience with myself for not working fast enough, patience with my co-workers who needed data/graphs/tables/*p*-values/something shiny right now for a presentation in five minutes(!), patience learning how partner organizations worked and how to fit in with that, patience learning the needs and abilities of the Ministry of Health staff, patience waiting for data updates. Patience. My biggest lesson learned was that when you aren't afforded the time to double-check everything, you still always do your best work. However, you do your best by keeping it simple and trusting your abilities and statistical intuition.

Finally, I must also acknowledge the constant and real interaction with people who were suffering with and dying from Ebola every day. By the time I arrived, the epidemic had been going on for months without a break, and no one knew when it might slow down. The entire region suffered horribly, and many thousands lost their lives or family. But what I consistently saw were people who were grateful for our presence, patient with our questions, and always welcoming and gracious.

Those who volunteered to work on the ground—in any capacity—may have had different motivations for going to West Africa, but there was comfort in knowing we were all there for the same reason: to get to zero.

Seeing the Big Picture

Jodi Vanden Eng is a statistician in the Division of Parasitic Diseases and Malaria at the Centers for Disease Control and Prevention in Atlanta, Georgia. She spent six weeks working in Sierra Leone as part of the ongoing Ebola emergency response. She earned her MPH in epidemiology from Yale University School of Public Health and MS in biostatistics from the University of Michigan Ann Arbor School of Public Health.



As a mathematical statistician at CDC, I consider myself a statistical programmer and consultant for epidemiologists. I've had the opportunity to work internationally many times while working in the Division of Parasitic Diseases and Malaria, which

has a large international component. In addition to statistical analysis, much of my fieldwork has involved developing tools and training ministry of health staff on the use of mobile data collection, specifically using PDAs and smartphones to improve data collection for national household surveys, surveillance, and other research projects.

I have traveled to West Africa several times. In fact, I had been to Sierra Leone four times previously to work on malaria prevention activities before being deployed for the Ebola response. I thought I was well prepared. I was used to the late night ferry crossing when you arrive at the airport; I was prepared for the hot harmattan weather (a dry, dusty wind); I was familiar with the geography, bumpy roads, traffic bottlenecks, and dilapidated government buildings; and I already knew some of the local customs, greetings, and not-too-distant history of civil war. Moreover, I had experience working in two other emergency deployments—one in 2005 after the tsunami in Indonesia and one in 2010 after the earthquake in Haiti.

Time Magazine had just released its Person of the Year edition, so I bought it at the airport and read it on the plane. I was heartened to read accounts from Ebola fighters, nurses, and doctors—the heroes on the front lines risking their lives to treat patients with a deadly and devastating virus. It was exciting to see a full profile picture and comment from CDC Director Tom Frieden at the end of the article, and it was sobering to have a sense of security because I thought the closest exposure I would have to someone with Ebola was analyzing his or her data.

I thought I was prepared, but when I arrived in Sierra Leone on December 21, 2014, for a six-week deployment, the epidemic was at its peak. About 500 new cases were being reported every week and it seemed no end was in sight.

The differences from my previous visits were immediately apparent. Instead of people holding hands and hugging in general social situations, there were nods and faint smiles. Curfews at night prevented social gatherings. Roadblocks with hand-washing stations and fever checks had become routine. And drivers yielded to ambulances and any vehicle with EBOLA RESPONDER on the windshield.

During an emergency, flexibility and resourcefulness are important. I thought I would be supporting data management and analysis, but a colleague and I were given the task of assessing the surveillance process and data flow for the country's Ebola response. This seemed insurmountable. How do you describe the surveillance and information systems of a newly introduced disease for an entire country? How do you account for the variation between districts, partners, and nongovernmental organizations? Despite the obstacles, it had to be done, so we developed a small standardized set of questions to

determine the data inputs, uses, and outputs during the stages of an Ebola response.

We visited Ebola response centers in several districts and assessed the data flow from beginning to end from the patient's perspective, including alerts (like 911), ambulances, case management, labs, quarantine, holding and treatment centers, contact tracing, and burials. At each of these stages, we attempted to identify variations among districts and potential data gaps and their causes. We assessed information technology infrastructure and resources. Most importantly, we obtained this information by meeting with key individuals without interrupting their primary response efforts.

During this assessment, I sometimes had mixed feelings about my work. Data collection and statistical analyses in emergency response seem like a catch-22. Data collection is often an extremely low priority—and rightfully so. Health centers need supplies; patients need beds, care, and transport; lab specimens need testing; potential contacts need tracing and monitoring to stop the chain of transmission; and families need closure for the loss of their loved ones. When people are dying, data are secondary.

Data are collected in the way they are most useful. In treatment centers without electricity, this means in a logbook and on a whiteboard. In urban areas with more resources, it means smartphones and geographic information systems. At the national level, it means reconciling and integrating all the data sources to make meaningful interpretations.

This can get chaotic. Nobody is thinking, "This may be better in a standardized relational database on the cloud." Nonetheless, real-time data during an outbreak are invaluable for coordinating response efforts. Not only do data describe the epidemiology of the disease, but they also identify areas with the greatest needs and allow donors to direct aid and resources efficiently and cost effectively.

I saw public health workers tirelessly visiting every health center to train and retrain staff on standard infection control procedures and survivors staying at treatment centers to provide care for other patients. Special unplanned meetings were held to figure out where to place newly orphaned children or how to care for a pregnant woman going into labor while in quarantine. A volunteer set up a village hotline to enable families to get feedback about their ill loved ones. Although these types of efforts cannot be measured with data, they are just as significant and crucial in a response.

Working on this data assessment allowed me to see the big picture of the outbreak. In doing so, I realized how much the little things matter. From well-wish letters sent by U.S. school children to encourage us to care packages sent by CDC colleagues and family members during the holidays, from the warm greetings and smiles of gratitude shared with the Sierra Leoneans to the waving hands of small children, we were reminded often that we had so much to work for and protect. ■

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SCIENCE POLICY

Technological Advance and Economic Growth: Stagnation or Revival?

Gordon Reikard

In March 2011, Gordon Reikard published a widely read Amstat News piece, “Stimulating Economic Growth Through Technological Advance,” (<http://bit.ly/1PGR0dq>) exploring the connection between investment in technology and economic growth. Revisiting the topic four and half years later, Reikard discusses the prospects for economic growth through the end of the decade.

—Steve Pierson, ASA Director of Science Policy

Over the last 10 years, the most commonly used measure of technological advance—total factor productivity (TFP)—has slowed considerably, especially when compared with the growth rates achieved during the previous two decades. This has led to a protracted debate about the future of economic growth. From one perspective, the United States is in an ongoing period of secular stagnation. The countervailing view is that this is a temporary hiatus and growth rates will pick up.

To get some perspective on this, it is useful to look at the long-term data. TFP, or multifactor productivity as defined by the Bureau of Labor Statistics, is defined as output less the contribution of labor and capital. In the short run, this measure can be volatile, but over longer periods—a full business cycle—the trend in TFP approximates the rate of technological advance. This insight owes to the seminal paper published by Nobel Laureate Robert Solow, “Technical Change and the Aggregate Production Function,” published in *Review of Economics*

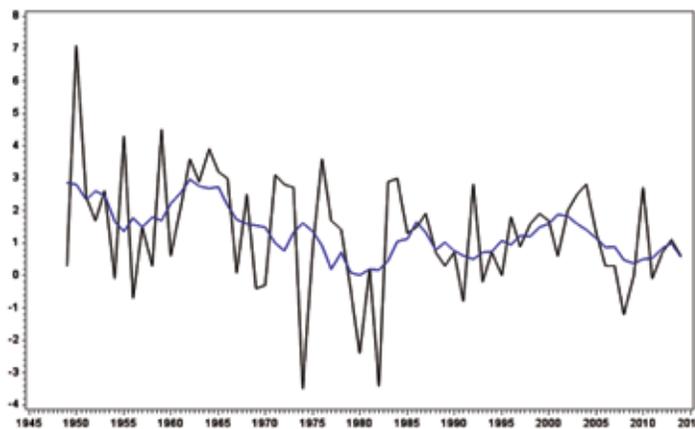


Figure 1: Multifactor Productivity, 1949–2014. Left scale: Annual percent change. Black: Actual. Blue: 7-year moving average.

and Statistics in 1957. Using this framework, over the long run, technical advance accounts for roughly 38% of growth in gross domestic product (GDP).

Figure 1 shows the percent change in TFP in the private business sector from 1949 to 2014 and a seven-year moving average. Several trends are immediately visible. From the late 1940s through the late 1960s, TFP was consistently strong. There was an extended dip in the 1970s, but starting in the early 1980s,

there was a second rise that lasted roughly until 2004. Since this time, however, TFP has clearly slowed down.

The early post-WWII period has often been described as a golden age for the American economy. Growth rates were consistently high, while recessions were brief. Unemployment declined, and inflation remained stable until the Vietnam War. One key factor was the high growth rate of technical advance. From 1949 to 1973, TFP averaged 2.16% per year.

Gordon Reikard is a statistician at U.S. Cellular. His research interests include the economics of growth and application of statistical methods in the physical sciences.

By the late 1960s, there were indications that the boom was slowing down. The slowdown hit with a vengeance in the mid-1970s. Some of this was due to shocks. OPEC raised oil prices by 400% from 1973 to 1974, and an additional 150% from 1979 to 1980. The inflation rate increased and the economy underwent deep recessions in 1975, followed by a double recession in 1980 and 1981 to 1982. From 1970 to 1982, TFP slowed to only 0.49%. TFP normally declines during downturns, and the successive recessions were unusually deep.

But the energy shocks and business cycle volatility masked a more important underlying problem. The gains in standards of living from the major technological advances of the 20th century had already been achieved. To revive, the economy needed new technologies.

This came in the form of computers and software. By the early 1980s, personal computers were becoming widely available, and they were increasingly being equipped with powerful software. This led to a series of spillover effects into other industries, which generated both gains in efficiency and entirely new products and services. Electronic banking made capital more mobile. Computerized inventory control enabled manufacturers to reduce fluctuations in stocks. CAD-CAM made it possible for engineers to design new products online. Word processing revolutionized offices. Local area networks made it possible to equip all the workers in a company with advanced technology. The Internet led to a revolution in worldwide communications. For statisticians, regressions could be run instantaneously, and even very sophisticated models such as neural networks could be programmed with a few commands.

The economy also benefited from lower inflation and a milder business cycle: Expansions were long, while recessions were shallower. From 1983 to 2004, TFP grew by 1.4% per year. The heyday was the period from 1996 onward, when TFP grew by better than 1.7% per year.

But then, starting around 2005, gains slackened again. From 2005 to 2014, TFP grew by 0.57%, only marginally higher than in the 1970s. The 2008–2009 recession played a role, but the business cycle is only part of the story. By the middle part of the last decade, many of the gains from computers had already been achieved.

This has serious implications for long-term growth. As the baby-boom generation retires, the labor force will level off, or even decline. As the contribution of labor inputs falls to zero, *all* future growth will have to come from capital investment or new technology. Adding TFP to the effect of capital, the growth rate would average about 1.5% annually.

At the same time, there are embryonic trends toward a new wave of technological advances. Artificial intelligence has now advanced to the point where much greater automation will be possible using intelligent machines. Manufacturing was already heavily automated during the 1990s, but with AI, it will be possible to integrate production lines with new techniques such as 3D printing and nanotechnology.

Productivity has been consistently strong in manufacturing industries, in part because these technologies can be deployed more easily to produce goods. But even in the service sector, the capabilities of software are only beginning to be exploited. The

Microsoft Office suite raised the productivity of office workers in the 1990s, but much more powerful statistical and analytical programs—ranging from SAS to the open software package R—have now been widely disseminated.

The emergence of large databases and the software to mine them (“Big Data”) has excited considerable interest. To date, most of the applications have been in marketing, with limited impact on growth. Instead, the real potential lies in the sciences, particularly fields like biochemistry.

A third area is biotechnology, which has applications in several areas. These include health care, agriculture, non-food use of crops, and other products such as biodegradable plastics and biofuels. Research in genetics has the potential to achieve major gains in medical care.

An even more intriguing possibility is that technological advances are already showing up in the national income accounts. In 2014, income ran ahead of product, and in the second quarter of 2015, GDP picked up. In the mid-1990s, income also grew faster than product, leading to a major revision that revealed growth had been higher than previously realized. One of the key elements of this revision was the explicit modeling of qualitative improvements in information technology using hedonic price increases.

While one should not read too much into a few quarters worth of data, the bulk of the evidence argues that a revival in technical advance is, in fact, quite possible. During each prior wave, it has taken some time—often well over a decade—to translate new designs into usable products. In this sense, the productivity slowdown of the last decade may be a transitory lull before the next set of technologies comes online. ■

STATISTICIAN'S VIEW

The Identity of Statistics in Data Science

Thomas W. Jones

Data science has been generating considerable interest inside and outside of the statistics community. Within the statistics community, there is a debate about whether data science and statistics are distinct disciplines. This conversation about data science betrays an anxiety about our (statisticians') identity.

In a July 2013 article in *Amstat News*, "Aren't We Data Science?" former ASA president Marie Davidian summarizes these concerns: "I've been told of university administrators who have stated their perceptions that statistics is relevant only to 'small data' and 'traditional' 'tools' for their analysis, while data science is focused on Big Data, Big Questions, and innovative new methods."

Similarly, Norman Matloff titled his November 2014 editorial in *Amstat News* "Statistics Losing Ground to Computer Science." He raised many good points, but his title cuts to the heart of our anxiety. Does "data science" mean we're being replaced?

I believe this anxiety stems from an overly-broad definition of statistics and an unclear definition of data science. For my part, I've come to see data science as supply chain management for "data products." This supply chain starts with real-world problems and ends with a report, business decision, or software. The middle contains lots of statistics, databases, programming, communicating, etc. Data science is fundamentally multidisciplinary. "But," you may ask, "isn't that just statistics?"

Davidian's article is titled "Aren't We Data Science?" after all. Randy Bartlett answered "We Are Data Science" in a subsequent Statistician's View. This "everything data" definition of statistics is popular among statisticians. Former ASA President Robert Rodriguez championed this view in 2012, offering ASA as a "big tent." The popular blog *Simply Statistics* states, "Whenever someone does something with data, we should claim them as a statistician."

There is historical precedent for this claim. Statistics as a discipline originated in the 18th century. Least squares dates to the early 1800s with Gauss and Legendre. We statisticians were the only data game in town, even as statistics became tied with mathematical probability in the 19th and early 20th centuries.

Yet times have changed. Judging by current statistics curricula, statistics is more closely tied to the mathematics of probability than to fundamentals

of data management. Survey the requirements of most graduate statistics programs. There is a core of courses in measure-theoretic probability, theoretical statistics, and linear models. I am not saying computation, database management, and application foci are absent. But the degree to which such courses are emphasized, or even offered at all, is highly variable. What proportion of programs require a scientific databases course or a high-performance computing course? We are well trained in quantifying uncertainty and deriving asymptotics. We are poorly trained in the tools of modern data management.

What has driven this structural break? Data have proliferated. This isn't about the volume of data in a "Big Data" sense, but rather that data are more popular. More data sets exist. More people are analyzing data. It is no longer the case (if it ever was) that only scientists, trained to deal with complexity, are the consumers of data products. The need for compelling visualizations and narratives to convey complicated stories has increased.

As models have become more accurate, they have also become more complex.

Ensembles of models are often better predictors than any single model. Ensembles are empirically accurate, but their asymptotic properties are often unknown. And an additional question arises: Asymptotic to what? One could take any or all of the number of observations, predictors, models in the ensemble, etc. to infinity and possibly arrive at different solutions. In the age of Big Data, asymptotic properties matter.

Finally, data are bigger in a Big Data sense. Storing, moving, and processing terabytes of data is neither simple nor all "statistical" in nature. There has long been a working relationship between statistics and computer science. But now software engineering knowledge is required if any useful analysis is to come from a Big Data project.

Whither statistics?

The More Things Change, the More They Stay the Same

In an age of Big Data, I believe statistics' focus on probability and asymptotic properties is more valuable, not less. As we move toward more complex statistical and machine-learned models, there is still a need to understand the properties of and to get



Tommy Jones is the director of data science at Impact Research, LLC. He holds an MS in mathematics and statistics from Georgetown University and a BA in economics from the College of William and Mary. He is a PhD student in the George Mason University Department of Computational and Data Sciences. He specializes in statistical models of language and time series modeling.

... [T]he fundamentals of probability and mathematical statistics taught today add tremendous value and cement our identity as statisticians in data science.

Further Reading

"Aren't We Data Science?," <http://magazine.amstat.org/blog/2013/07/01/datascience>

"Statistics Losing Ground to Computer Science," <http://magazine.amstat.org/blog/2014/11/01/statistics-losing-ground-to-computer-science>

"We Are Data Science," <http://magazine.amstat.org/blog/2013/10/01/we-are-data-science>

"ASA President Robert N. Rodriguez Calls for Creating the 'Big Tent' for All Statisticians," www.amstat.org/news/pdfs/RodriguezSpeech8_13_12.pdf

"Statistics/Statisticians Need Better Marketing," <http://simplystatistics.org/2012/08/14/statistics-statisticians-need-better-marketing>

"A Very Short History of Data Science," <http://www.forbes.com/sites/gilpress/2013/05/28/a-very-short-history-of-data-science/>

"The Role of Statistics in Data Science," <http://www.amstat.org/misc/DataScienceStatement.pdf>

inferences from these models. A (computational) data scientist once told me "statisticians will be the ones to help us figure this mess out." These are questions at the heart of theoretical statistics.

And in a world that is streaming data, careful research design and data collection are as important as ever. A biased sample is still biased if it has a million observations. This is especially important when the data are born of the Internet and people implicitly or explicitly opt in. These are challenges survey statisticians face regularly.

Recent research by statisticians is tackling some of these issues. Gerard Biau, Luc Devroye, and Gabor Lugosi have demonstrated the consistency of averaging classifiers (http://machinelearning.wustl.edu/mlpapers/paper_files/biau08a.pdf). Stefan

Wager, Trevor Hastie, and Bradley Efron propose methods to get prediction errors of bootstrapped and bagged learners (<http://arxiv.org/pdf/1311.4555.pdf>). Abhijit Dasgupta et. al show how to estimate effect size using nonparametric, "black box" models (www.ncbi.nlm.nih.gov/pubmed/24581306). Andrew Womack, Elias Moreno, and George Casella have shown that a popular model for text mining is an inconsistent estimator (www.stat.ufl.edu/~ajwomack/WMC-LDA.pdf).

But Sometimes, Things Just Change

While many of the fundamental problems facing statisticians are the same, the applications and environment are different. Statistics education, particularly at the graduate level, must adapt. As data get "bigger" and research and applications become more multidisciplinary, the need for statisticians to communicate and collaborate with a wide range of professionals and laypeople increases.

Statistics education should require minimum competency in fundamentals of computer science. ASA's recent statement, "The Role of Statistics in Data Science" highlights three data science skillsets: database management, statistics and machine learning, and distributed and parallel systems. Statisticians must work closely with software engineers to develop solutions that scale. We must understand the code so that scaled solutions still have desirable statistical properties. I believe that statisticians should have minimum foundational training in database management and high-performance computing.

In addition, examples and applications in introductory statistics courses may need updates. For example, ensemble methods will be at least as important as linear regression in the coming years. We may consider teaching concepts like Zipf's and Heap's laws early on, as analyses of linguistic data are growing more common.

It is an exciting time to be a statistician. Statistical models and methods are applied in ways unimaginable only a decade ago. Airplanes fly themselves; doctors use statistical models to aid diagnoses; scientific research involves mining massive data sets. The importance of these tasks makes understanding our models an imperative. Yet, fundamental statistical properties of these models remain little understood.

I am not convinced that statistics is data science. But I am convinced that the fundamentals of probability and mathematical statistics taught today add tremendous value and cement our identity as statisticians in data science. ■

Join Us for the 5th Annual Conference on Statistical Practice

Amy Farris, ASA Director of Membership Development and Marketing



The fifth annual ASA Conference on Statistical Practice will be held in San Diego, California, February 18–20, 2016. Once again, CSP will provide opportunities for attendees to learn new statistical methodologies and best practices in statistical analysis, design, consulting, and statistical programming.

The steering committee has organized an innovative and engaging program, including concurrent sessions, courses, tutorials, posters, and practical computing demonstrations. The conference will also host exhibits.

The intimate and personal format of CSP provides a unique opportunity to strengthen your relationships within this unique community while enhancing your career.

Keynote Address

The keynote address, “Communicating the Value of Statistics” will be delivered by ASA President-elect Jessica Utts.

Mentoring Program

Participate as either a mentor or mentee. Register for the conference and the ASA will automatically send you information about how to participate in the mentorship program. There is no cost to participate, but mentees are selected via an application process and participation is limited.

Career Service

CSP also provides an online career service system to connect employers and applicants so they can pursue informal meetings and interviews. All registered CSP attendees will be able to post their résumés at no charge. Applicants can access current job openings and contact employers in advance of the conference.

Early registration for the conference is open through January 5, 2016. For details and deadlines, see www.amstat.org/meetings/csp/2016. Our goal is to maintain the intimate and personal feel of the conference, so register before the conference and courses are filled. ■



LEARN MORE
For conference updates,
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Educational Ambassador from Cuba, Nigeria Sought

The ASA is seeking qualified Cuban and Nigerian nationals to serve as the 2016 Educational Ambassador (www.amstat.org/education/educambassador.cfm). The selected ambassador will be subsidized to attend the Joint Statistical Meetings to take one or more Continuing Education (CE) courses in an emerging area of research and return to teach the subject matter in his or her home country and/or region.

The nomination deadline is December 31.

BIENNIAL ELECTRONIC CONFERENCE ON TEACHING STATISTICS

Call for Proposals

Proposals are being accepted through February 1, 2016, for the Electronic Conference on Teaching Statistics (eCOTS), to take place May 16–20, 2016. The online conference will focus on undergraduate statistics education.

The theme is “Changing with Technology.” Technology is inspiring change in many aspects of statistics education: *what* we teach (curriculum), *how* we teach (pedagogy), *who* we teach (audience), and *why* we teach (goals). Proposals can address technology-induced change in any of these areas.

Also included in the conference are virtual panel discussions, breakout sessions, workshops, posters, birds-of-a-feather discussions, and—new this year—regional face-to-face mini-conferences connecting to eCOTS.

The types of proposals sought include the following:

Breakout sessions, which will be half-hour webinars about a particular topic. Audience engagement during these sessions is encouraged. In addition to leading the actual session, some breakout session leaders may be organized into panels addressing a common topic. Each submission will be reviewed.

Virtual posters, which will record a brief (maximum 5 minutes) presentation to be posted on the website and displayed throughout eCOTS. Conference attendees will be encouraged to view posters throughout the week and leave comments or questions. Presenters are encouraged to check their posters frequently and respond to comments.

Birds-of-a-feather discussions, which will take place during the program gaps built in for regional conferences and provide an opportunity for those not located near a regional conference to discuss a particular topic. Discussion leaders should be prepared to organize and facilitate discussion (not give a presentation) and use GoToMeeting software.

All proposals should be related to the theme and include a title, brief abstract, description of how the topic relates to the theme, and—for breakout sessions—a description of how the session will engage participants and what you hope participants will take away from your presentation.

For details, visit www.causeweb.org/ecots/ecots16/proposals. For questions, contact the program chair, Kari Lock Morgan, at klm47@psu.edu.

The selected ambassador will be expected to complete the following by December 2017:

- Attend the 2016 Joint Statistical Meetings (www.amstat.org/meetings/jsm/2016) in Chicago, Illinois, to take CE courses in an emerging area of statistics research (CE courses offered in 2015 are available at www.amstat.org/meetings/jsm/2015/onlineprogram).
- Return to your home country, and within the next year, teach a one-semester class with no fewer than 10 students on the subject matter of the CE course at the master’s level and write lecture notes in the language locally deemed most appropriate. You will need to repeat the class the following semester. (The committee understands there can be practical and organizational considerations that can make it difficult to meet this requirement. Should this arise, the committee will be prepared to work with the ambassador to devise an alternative plan. The ASA will also investigate the possibility of providing further assistance through recorded webinars related to the CE course material.)
- Submit a report by December 2017 to the ASA through the Committee on International Relations in Statistics and the ambassador’s home institution describing how the transfer of knowledge has been accomplished and how you invited statisticians from your country to work with you on the subject matter of your course.

The ASA will arrange and pay for the selected ambassador’s airfare, hotel, meeting registration, and CE course registration. The ASA also will reimburse the visa application fee and provide a \$500 stipend.

Candidates for the ambassadorship must hold a PhD or equivalent degree in statistics or a related field and be employed at the level of assistant or associate professor at a recognized university or research organization promoting the teaching and application of statistics.

Interested candidates should send the following to Geert Molenberghs at geert.molenberghs@uhasselt.be:

- A curriculum vitae
- A proposal (at most two pages) describing how the ambassadorship will help disseminate knowledge of statistics in your country and how the ASA’s expectation set forth above will be implemented upon your return home
- A letter from the head of your academic unit (e.g., department chair, director, or the dean) indicating institutional support for your dissemination plan ■



Nell Sedransk

National Institute of Statistical Sciences (NISS) Chair Mary Batcher recently announced that the institute's new director is **Nell Sedransk**.

"The search committee felt that Nell was the best person for this position. She brings a wealth of experience and expertise to the role of director and has done a tremendous job restructuring the organization this past year to help ensure its future success," noted Batcher.

In her new role, Sedransk will lead the institute into its second quarter century with its current foundation of statistical research and service to the NISS affiliate organizations from academia, government, and industry. "I am very pleased to have this opportunity to help NISS continue to grow and thrive," said Sedransk. "I look forward to the coming months as we begin to focus on increasing research activities, expanding the postdoctoral fellowship program, and engaging with new collaborators and clients for NISS."

Sedransk has served as acting director since September 2014, having been associate director since 2005. She came to NISS from the National Institute of Standards and Technology, where she was chief of the statistical engineering division.

Since earning her PhD from Iowa State University, Sedransk has spent much of her career in academia, where she directed

five master's and seven PhD students. Her research contributions in the areas of statistical theory and the application of statistics to medicine, immunology, engineering, social science, and education include more than 100 primary research publications and co-authorship of four books.

At NISS, Sedransk has continued to mentor postdoctoral fellows and engage in statistical

methodological research. She also serves as associate director of the Statistical and Applied Mathematical Sciences Institute. As NISS director, she will be based in the Washington, DC, office.

For more information about NISS, visit www.niss.org, follow @NISSAMS on Twitter, and join the NISS group on LinkedIn and Facebook. ■

Obituaries

Charles Edgar "Chuck" Gates

Charles Edgar "Chuck" Gates, 89, of Bryan, Texas, died peacefully September 8, 2015, at his residence.

An ASA Fellow and longtime member, Gates was born March 6 in Rapid City, South Dakota. He was a veteran of World War II and the Korean War and worked as a statistician and professor at the University of Minnesota for 10 years, and then for 28 years at Texas A&M University. His specialties were in experimental design, wildlife abundance estimation, and agricultural application. During his career, he was an editor of *The American Statistician* and travelled extensively, visiting 79 countries over the course of his life.

Following his retirement, Gates served as an income tax volunteer for the AARP and was a member of Covenant Presbyterian Church. His other interests included playing bridge, collecting stamps, playing tennis, bicycling, and dancing.

In addition to his wife, he is survived by three daughters: Greta Watkins and husband, Randy, of Bryan, Texas; Gail Gates of Stillwater, Oklahoma; and Glenda Honea and husband, Robert, of Danville, Virginia.

In lieu of flowers, the family requests donations to Hospice of Brazos Valley, Covenant Presbyterian Church, or the Alzheimer's Association at alz.org.

Alvan "Al" Zarate

Alvan "Al" Zarate passed away August 27, 2015, at Washington Hospital Center due to complications from treatment for pancreatitis. He was 78.

Al worked for the National Center for Health Statistics (NCHS) as a confidentiality officer who was dedicated to protecting the confidentiality of NCHS survey respondents. In 2008, he was elected fellow of the American Statistical Association. A year later, he received the NCHS Program Mission Support Award for his leadership in the field of data privacy and confidentiality.

Al earned a PhD from Brown University and taught sociology/demography at The University of Texas, Tulane, and Ohio State before joining NCHS in 1978.

Al was also a talented musician who loved to play the guitar and sing—which he often did at NCHS. In the last several years, he sang with the Bowie Senior Chorale and was a member its smaller traveling group, the Choraleers, who did special performances throughout the Bowie community. He loved performing and the community. Al was always happy when he had a guitar in his hand.

To read more about Al's life or make a memorial contribution to charities Al supported, visit the memorial networks obituary page at <http://bit.ly/1MIcCr8>.

Deadlines and Contact Information for ASA National Awards, Special Lectureships, and COPSS Awards

Deadlines and Awards	Nominations	Questions
December 15, 2015		
COPSS Fisher Lectureship and Award	www.copss.org	
ASA Noether Senior and Young Scholar Awards	Pam Craven pamela@amstat.org	Edsel A. Pena pena@stat.sc.edu
Monroe G. Sirken Award in Interdisciplinary Survey Methods Research	Pam Craven pamela@amstat.org	John L. Czajka jczajka@mathematica-mpr.com
January 15, 2016		
COPSS Presidents' Award	www.copss.org	
Elizabeth L. Scott Award	www.copss.org	
February 1, 2016		
Karl E. Peace Award for Outstanding Statistical Contributions for the Betterment of Society	Pam Craven pamela@amstat.org	Paul S. Albert albertp@mail.nih.gov
ASA W. J. Dixon Award for Excellence in Statistical Consulting	Pam Craven pamela@amstat.org	
February 15, 2016		
Causality in Statistics Education Award	educinfo@amstat.org	
Harry V. Roberts Statistical Advocate of the Year Award	Pam Craven pamela@amstat.org	Mary J. Kwasny m-kwasny@northwestern.edu
ASA Samuel S. Wilks Memorial Medal	Pam Craven pamela@amstat.org	Lynne Billard lynne@stat.uga.edu
ASA Waller Distinguished Teaching Career Award	Pam Craven pamela@amstat.org	Bradley A. Hartlaub hartlaub@kenyon.edu
ASA Waller Education Award	Pam Craven pamela@amstat.org	Bradley A. Hartlaub hartlaub@kenyon.edu
ASA W. J. Youden Award in Interlaboratory Testing	Pam Craven pamela@amstat.org	Blaza Toman blaza.toman@nist.gov
February 20, 2016		
ASA Statistics in the Physical and Engineering Sciences Award	Philip J. Ramsey pjrstats@aol.com	Philip J. Ramsey pjrstats@aol.com
February 23, 2016		
ASA Gertrude M. Cox Scholarship	Pam Craven pamela@amstat.org	Eloise E. Kaizar ekaizar@stat.osu.edu
March 1, 2016		
ASA Edward C. Bryant Scholarship	Pam Craven pamela@amstat.org	Pushpal Mukhopadhyay pushpal.mukhopadhyay@sas.com
ASA Excellence in Statistical Reporting Award	Pam Craven pamela@amstat.org	Morteza Marzjarani mortkm2@yahoo.com
ASA Fellows	www.amstat.org	J. Jack Lee jjlee@mdanderson.org
ASA Mentoring Award	Pam Craven pamela@amstat.org	David R. Morganstein davidmorganstein@westat.com
ASA Outstanding Statistical Application Award	Pam Craven pamela@amstat.org	DuBois Bowman dubois.bowman@columbia.edu
March 15, 2016		
ASA Founders Award	Pam Craven pamela@amstat.org	David R. Morganstein davidmorganstein@westat.com

Sirken Award

The Monroe G. Sirken Award in Interdisciplinary Survey Methods Research honors the accomplishments of its namesake, recognizes the accomplishments of the awardee, and enhances awareness among the statistical community of the scope and importance of Sirken's contributions.

Each year, an individual is selected to deliver the Sirken Lecture at the Joint Statistical Meetings and receive an honorarium. All lecturers are selected from nominations submitted by ASA members.

Additional information about the award, including information about submitting a nomination, can be found at www.amstat.org/awards/monroesirkenaward.cfm. ■

Deming, Noether Awards

The ASA Deming Lecturer Award and Gottfried E. Noether awards honor the accomplishments of Gottfried E. Noether and W. Edwards Deming, recognize the accomplishments of the awardee, and enhance awareness among the statistical community of the scope and importance of Noether and Deming's contributions.

Each year, those selected deliver a lecture at the Joint Statistical Meetings and receive an honorarium. All lecturers are selected from nominations submitted by ASA members.

Additional information about each lecture, including information about submitting a nomination, can be found at www.amstat.org/awards/awardsscholarships.cfm. ■

Nominations Wanted for 2016 Don Owen Award

The San Antonio Chapter is accepting nominations from ASA chapters in North America for the 2016 Don Owen Award, which is presented to a statistician who embodies the three-fold accomplishments of Donald B. Owen: excellence in research, statistical consultation, and service to the statistical community.

Nominees must be a member of the ASA, but are not required to be a member of the nominating chapter. In addition to a cover letter highlighting the accomplishments of the nominee, the nomination packet must contain the following supporting information:

- Name of the nominee
- Degrees (titles, dates, schools)
- Present position(s), followed by significant former positions (with dates)
- List of major publications having statistical content
- List of activities related to teaching and dissemination of statistical knowledge
- List of consulting activities related to statistical problems or editorial contributions
- List of activities supporting the mission of the ASA and related professional organizations

To nominate someone, send the nomination packet as a PDF via email to Joel Michalek at michalekj@uthscsa.edu with "Owen Award" in the subject field. Alternatively, six copies of the nomination packet can be mailed to Joel Michalek, Department of Epidemiology and Biostatistics, University of Texas Health Science Center at San Antonio, 7703 Floyd Curl Drive, San Antonio, TX 78229.

The deadline for nominations is February 5, 2016.

Before his death in 1991, Owen was distinguished professor of statistics at Southern Methodist University in Dallas. He authored seven textbooks, seven monographs, and more than 75 articles in refereed journals; trained 19 doctoral and master's students; served as an applied statistician for 10 years at the Sandia Corporation; and operated a private consulting firm that specialized in quality control. Owen was editor of *Communications in Statistics* for both Series A and B, associate editor of *Technometrics* and *JASA*, and editor of more than 50 textbooks.

sectionnews

Biometrics

Edited by Sheng Luo, Section Publications Officer

The Biometrics Section is seeking applications for the 2016 David P. Byar Young Investigator Award. This annual award is given to an early-stage investigator for best paper to be presented at JSM. The winner will receive \$2,000. For details, visit <http://bit.ly/1LeEO0o>.

The section also funded an award for a PhD-level biostatistician interested in conducting methodological or collaborative research in radiology/imaging clinical trials to attend the Radiological Society of North America (RSNA) Clinical Trials Methodology Workshop in La Jolla, California, from January 9–15, 2016. This award went to Yin Xi of The University of Texas Southwestern Medical Center to cover up to \$3,000 in travel costs.

For more information about the Biometrics Section, access the section's web page by clicking on "Section" at the top www.amstat.org. ■

Medical Devices and Diagnostics

The ASA Medical Devices and Diagnostics (MDD) Section will sponsor a student paper competition for JSM 2016. A manuscript, suitable for journal submission, is required to enter the competition. The winner will receive a \$500 award.

To be eligible for the award, applicants must be a member of the section and have been a full-time student (undergraduate, master's, or PhD) on or after September 1, 2016, or be within two years of graduation if the submitted work was initiated while the applicant was a student. The applicant must be first author of the paper, and the adviser (or other coauthor) must write a letter stating that the applicant had primary responsibility for the research and write-up.

To apply for the award, send the following in PDF format by December 15 to MDDpaperJSM2016@gmail.com:

- A curriculum vitae
- A letter from the adviser (or other coauthor) verifying the student status of the applicant and briefly describing the applicant's role in the research and writing of the paper
- A cover letter describing the contributions of the paper to MDD
- The paper—including all tables, figures, and appendices as a single PDF file

Selection of Winners

Papers will be reviewed by an MDD committee. Criteria for selection include novelty in theory/methods/applications, significance and potential impact of the research, and clarity of writing and presentation. Decisions of the committee are final.

Applicants will be notified by January 30, 2016. The winners (including those receiving honorable mention) must submit abstracts and register for JSM by February 1, 2016, through the official JSM abstract submission system (<http://bit.ly/1LSQlzP>). Winners must present a talk under the auspices of the MDD on the topic of the winning paper. Those who are not selected are encouraged to submit a contributed abstract to JSM 2016.

The best paper winner and honorable mentions will be presented with a certificate at the MDD meeting at JSM. For more information about the award, visit www.amstat.org/sections/studentpaperawards.cfm. ■

Quality and Productivity

Students in statistics programs can benefit from participating in statistical conferences and other professional activities. To aid these students in their involvement, the ASA's Quality and Productivity (Q&P) Section's student scholarship program offers support to attend the Joint Statistical Meetings. This year, five \$400 scholarships were awarded to the following students to attend JSM in Seattle, Washington:

- **Ahmed Mohamed Eshebli**, Missouri University of Science and Technology
- **Richard Seymour**, Air Force Institute of Technology
- **Michael Lee Walker**, University of Alabama
- **Yandan Yang**, Southern Methodist University
- **Rong Zheng**, University of Alabama

Recipients were recognized at the joint Q&P/SPES mixer at JSM.

Looking forward to 2016, Q&P will offer up to three travel awards of \$400 each for students enrolled in a graduate program with a concentration in applied statistics and/or quality management to attend JSM in Chicago, Illinois, from July 30 to August 4. Student applicants must show a demonstrated interest in quality applications as evidenced by course work, research topic, or prior work experience. Applicants either presenting a paper or participating in a poster session will receive extra consideration.

Applications will be accepted December 1 to February 1, 2016. Complete information about the award and how to apply is posted at <http://bit.ly/1GKIP8U>. ■

Physical and Engineering Sciences

Michael Crotty, SPES Awards Chair

The Section on Physical and Engineering Sciences is pleased to announce the results of its annual competition for contributed papers presented at the 2015 Joint Statistical Meetings in Seattle, Washington.

Outstanding Presentation Award

- **Christine Anderson-Cook**, Los Alamos National Laboratory, for “Using Multiple Objectives to Select an Optimal Split-Plot Design for a Mixture-Process Experiment”
- **Jonathan Stallings** (runner-up), North Carolina State University, for “Carryover Designs Including Washout Periods”

Honorable Mentions

- **Shan Ba**, Procter & Gamble, for “Maximum Projection Designs for Computer Experiments”
- **Gwendolyn Eadie**, McMaster University, for “Incomplete Data and Measurement Error in the Galactic Mass Estimation Problem”
- **Greg Piepel**, Pacific Northwest National Laboratory, for “Mixture Experiment Design Varying One, Two, and Three Components at a Time”
- **Camilla Sammut-Powell**, University of Manchester, for “Experimental Designs Optimally Attuned for Time Trends”

The outstanding presentation awards encourage excellence in presentation and have helped raise the SPES contributed sessions to a higher level of quality. All awards are based on audience evaluations of each speaker.

Winners receive a certificate recognizing their accomplishment and a cash award. The awards for the 2015 JSM best presentations will be presented at the SPES mixer during the 2016 meetings in Chicago, Illinois.

Start preparing now for JSM 2016 in Chicago, Illinois, and you may see your name listed among the SPES Outstanding Presentation Award winners next year. ■

Government Statistics

Wendy Martinez, GSS Section Chair

The Government Statistics Section is sponsoring Data Challenge 2016 during the Joint Statistical Meetings in Chicago. The contest is open to anyone, including college students and professionals from the private or public sector. This contest chal-

lenges participants to analyze a government data set using statistical and visualization tools and methods. There will be two award categories: professional and student. One or more topic-contributed or poster sessions at JSM will be established for contest submissions. (Presenters are responsible for their own registration, travel, and other attendance costs.)

The data set for the GSS Data Challenge 2016 will be the Department of Transportation’s General Estimates System (GES), which is collected by the National Highway Transportation Safety Administration. The GES contains a representative sample of police-reported motor vehicle crashes of all types. Contestants are free to use any or all of the data in their analysis. The data and other information (data dictionaries, manuals, etc.) can be found at <ftp://ftp.nhtsa.dot.gov/GES>.

Contestants must email Wendy Martinez at martinez.wendy@bls.gov expressing their interest in participating by January 4, 2016. For details, visit the GSS website at www.amstat.org/sections/sgovt.

The section also sponsors the following awards, which are typically announced at JSM:

- Jeanne E. Griffith Mentoring Award, given to federal, state, or local government statisticians for efforts supporting the work and developing the careers of junior statistical staff
- Wray Jackson Smith Scholarship, to reward promising young statisticians and encourage them to consider a future in government statistics
- Roger Herriot Award for Innovation in federal statistics
- Pat Doyle Award, given to a person who contributes to the section in a way that leaves a lasting effect on both the section and ASA
- Student Paper Competition for student and post-graduate papers

Consult the GSS website for deadlines and other details.

Finally, it is time to start thinking about the JSM 2016 contributed program. We hope you will consider organizing a topic-contributed (TC) session for possible GSS sponsorship. Proposals for TC sessions must be submitted to the online system by January 14, 2016. While not required, it is a good idea to contact our GSS program chair, Morgan Earp (earp.morgan@bls.gov), with your idea for a TC session before you submit your proposal. The online system (www.amstat.org/meetings/jsm/2016/tcsessions/index.cfm) will be open from December 1 to February 1, 2016. ■

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.

UNIVERSITY OF CINCINNATI

Applications are invited for a Tenure-Track Assistant Professorship in Statistics

The Department of Mathematical Sciences has a strong graduate program offering both MS and PhD degrees in statistics, and in pure and applied mathematics. The department is dedicated to excellence in both research and teaching. Statistics faculty in the department are involved in both methodological and interdisciplinary research. Their research interests include Bayesian methods and statistical methods for massive data, in general, and computer experiments, high-dimensional data analysis, statistical machine learning, and graphical models, in particular.

The normal teaching load for research-active faculty is 6 credit hours per semester with a 25% reduction for new faculty in each of the first 2 years and a reduced service role. The job duties include maintaining an active research program in Statistics to constantly seek external funding, to mentor graduate students, and to teach both graduate and undergraduate courses in Statistics and related areas.

Completed applications consisting of a cover letter, CV, description of research program (if applicable), description of teaching experience (if applicable), and three letters of recommendation should be submitted @ <https://www.mathjobs.org/jobs?job-122-7689>. Applicants should also submit a CV and cover letter on UC's recruitment system at the link listed in the detailed ad on mathjobs.org. Review of applicants will begin on December 1, 2015. The appointment will begin on August 15, 2016. The position requires a PhD degree in the area of statistics or equivalent awarded by August 14, 2016. Inquiries concerning the position should be directed to, Dr. Siva Sivaganesan, the Search Committee Chair, or Dr. Shuang Zhang, Head, Department of Mathematical Sciences.

The University of Cincinnati is an equal opportunity/affirmative action employer with a strong commitment to diversity. We actively seek a broad spectrum of candidates including women, people of color, people with disabilities and veterans.

Arkansas

■ The math department at the University of Central Arkansas is seeking applications for tenure-track assistant professor in applied statistics, beginning August 2016. A PhD or equivalent required. Regular teaching load is 12 hrs/semester. Applicants should upload cover letter, CV, transcripts, teaching & research statements, and three reference letters to: <https://jobs.uca.edu> (F0472015). Review will begin December 7, 2015. More information: www.uca.edu/math. UCA is an EO/AA Employer.

California

■ Department of statistics & applied probability, University of California, invites applications for a visiting assistant professor position in statistics; starting 7/1/2016. Qualifications: research/teaching excellence; PhD in statistics, biostatistics or related fields. Candidates who can contribute to the diversity of excellence of the academic community through research, teaching and service are particularly encouraged to apply. Additional information at: <https://recruit.ap.ucsb.edu/apply/JPF00561>. An EO/AA employer.

■ RAND Corporation is seeking PhD statisticians for exciting opportunities to collaborate on multidisciplinary public policy research projects. Openings exist for recent graduates and experienced statisticians. See our ad in the September *Amstat News* for details or go to www.rand.org/statistics. Applications received by December 15, 2015, will receive priority. Applications must be submitted online following the instructions at www.rand.org/statistics/jobs.html (search PhD Statistician). Send questions to Lou_Mariano@rand.org. EO/AA Employer.

■ The San José State University Department of Mathematics and Statistics has one tenure-track assistant professor opening in statistics and computational statistics starting August 2016. Subject to Budgetary Approval. Job Opening ID (JOID): 23386. See the complete position description at www.sjsu.edu/math/employment. PhD required by time of appointment. For full consideration, submit all application materials at www.mathjobs.org by December 1, 2015. SJSU is an AA/EOE.



The University of Vermont Tenure–Track Assistant Professor

The Department of Mathematics and Statistics at the University of Vermont invites applicants for a tenure-track faculty position at the rank of assistant professor in Biostatistics. Expertise in one or more of the following areas is highly desirable: high-dimensional modeling, Bayesian analysis, modeling of failure time data, statistical learning, and statistical genetics. Interest and experience in cross-disciplinary collaborations is also highly desirable. The successful candidate will be expected to develop an independent program of methodological research while cultivating collaborations with other investigators, as well as contribute to the educational mission of the university at the undergraduate and graduate levels. Review of applications begins 12/1/2015.

The University of Vermont is an Equal Opportunity/Affirmative Action Employer and actively encourages applications from women, veterans and people with diverse racial, ethnic, and cultural backgrounds.

For more information and to apply online, visit www.uvmjobs.com (search position no. 005888).



DEPARTMENT OF STATISTICS 4 Tenure-Track Openings

The Virginia Tech Department of Statistics (www.stat.vt.edu) has four tenure-track openings. We seek individuals with strong academic credentials in statistics, the ability to develop an independent research program, and who have the potential to excel in teaching. Applicants must have earned a doctorate in statistics or a closely related field at the time of appointment.

- **Computer modeling/data analytics.** Two full-time positions at the assistant professor level in support of the cross-disciplinary Computational Modeling and Data Analytics (CMDA) program (www.science.vt.edu/ais/cmda). Required is a research focus in computationally intensive statistical methods, data analytics, machine learning, or a related field. Applications are due by November 1st and must be submitted online at listings.jobs.vt.edu (posting #TR0150098). Interviews may start as early as December 1st.
- **Biostatistics & stochastic modeling.** Two full-time positions at the rank of assistant or associate professor. For the first position, specialization in some area of health-related statistics, such as biostatistics, neuroscience, epidemiology, or bioinformatics is required. For the second, specialization in complex stochastic modeling and computation for large-scale data and analysis is required. Applications are due by December 1st and must be submitted online at listings.jobs.vt.edu (posting #TR0150097).

Exceptional candidates may be considered at more senior ranks for all of the above positions. Virginia Tech is an EO/AA university, and offers a wide range of networking and development opportunities to women and minorities in science and engineering, and additionally provides a competitive dual hiring program for couples.

Virginia Tech is an Equal Opportunity/Affirmative Action Institution.

Delaware

■ Senior Research Biostatistician. The Nemours Center for Healthcare Delivery Science seeks a senior research biostatistician to join its team in Wilmington, DE. The biostatistician will facilitate planning, conduct and analysis of independent and collaborative research. A doctoral degree in biostatistics or closely related field and five years of related post-doctoral experience are required. Send CV and cover letter to Dana Berger: dana.berger@nemours.org. Apply online: <http://careers.nemours.org/jobs/57067> EOE.

Florida

■ University of Miami, School of Business Administration, Coral Gables, Florida. The department of management science at the University of Miami invites applications for two tenure-track positions starting August 2016 subject to budgetary approval. Salaries are extremely competitive and generous summer research support is anticipated. A PhD degree in statistics, operations research or a related field is required. Applications should be submitted by email to MASrecruiting@bus.miami.edu. The University of Miami is an AA/EOE.

■ The department of management science at the University of Miami invites applications for a clinical-track faculty position starting August 2016 subject to budgetary approval. This is a non-tenure track position that focuses on business applications. A PhD degree in statistics, operations Research or a related field is required. Applications should be submitted by email to MASrecruiting@bus.miami.edu. The University of Miami offers competitive salaries and a comprehensive benefits package including medical and dental benefits, tuition remission, vacation, paid holidays and much more. The University of Miami is an AA/EOE.

Kentucky

■ Tenure-track position, assistant professor, starting August 2016. PhD in statistics, biostatistics, or a related area is required by the start of employment. For details, see www.math.uky.edu. Submit letter of application, curriculum



2016-17 Postdoctoral Fellowships at SAMSI

Six postdoctoral fellowships are available at the Statistical and Applied Mathematical Sciences Institute for two Research Programs in 2016-17: **Optimization**; and **Statistical, Mathematical and Computational Methods for Astronomy**. Appointments will begin in August 2016 and typically last two years. Appointments are made jointly between SAMSI and one of its partner universities, where teaching is a possibility. Competitive salaries, travel stipends, and health insurance will be offered.

The Optimization Program aims to leverage the synergy amongst mathematics, statistics and operations research to produce groundbreaking advances in three categories:

- 1) Optimization for large-scale statistical analysis,
- 2) Statistical approaches for the numerical solution of large-scale optimization problems,
- 3) Applications of optimization.

For additional information on this program, please see: <http://www.samsi.info/OPT>

The Statistical, Mathematical and Computational Methods for Astronomy Program focuses on the vast range of statistical and mathematical problems arising in modern astronomical and space sciences research, particularly due to the flood of data produced by both ground-based and space-based astronomical surveys at many wave-bands. To cope with the current and future needs of astronomy missions requires concerted efforts by cross-disciplinary collaborations involving astronomers, computer scientists, mathematicians and statisticians. The main research areas would include:

- 1) Astronomical simulations and big data issues,
- 2) Exoplanets,
- 3) Gravitational wave astrophysics,
- 4) High-performance computing,
- 5) Lightcurve analysis in astronomy.

For additional information on this program, please see: <http://www.samsi.info/ASTRO>

The deadline for full consideration is December 15, 2015, although later applications will be considered as resources permit.

SAMSI is an AA/equal opportunity employer. All qualified applicants are encouraged to apply, especially women and members of minority groups.

To apply, go to mathjobs.org, SAMSIPD2016 Job #7448

Williams College Assistant Professor

The Williams College Department of Mathematics and Statistics invites applications for two tenure-track positions in statistics, beginning fall 2016, at the rank of assistant professor (in an exceptional case, a more advanced appointment may be considered). We are seeking highly qualified candidates who have demonstrated excellence in teaching and research and who are committed to working with an increasingly diverse student body. The candidates will become the fourth and fifth tenure-track statisticians in the department, joining a vibrant and active statistics group with a newly established statistics major. The teaching load is two courses per 12-week semester and a winter term course every other January. In addition to excellence in teaching, an active and successful research program is expected. The candidate should have a Ph.D. by the time of appointment. We welcome applications from members of groups traditionally underrepresented in the field.

Candidates may apply via interfolio.com by uploading their vita and having three letters of recommendation on teaching and research uploaded to <http://apply.interfolio.com/30206>. Teaching and research statements are also welcome. Evaluations of applications will begin on or after November 15 and will continue until the position is filled. All offers of employment are contingent upon completion of a background check. Further information is available upon request. For more information on the Department of Mathematics and Statistics, visit <http://math.williams.edu/>.

Williams College is a coeducational liberal arts institution located in the Berkshire Hills of western Massachusetts. The college has built its reputation on outstanding teaching and scholarship and on the academic excellence of its approximately 2,000 students. Please visit the Williams College website (<http://www.williams.edu>). Beyond meeting fully its legal obligations for non-discrimination, Williams College is committed to building a diverse and inclusive community where members from all backgrounds can live, learn, and thrive.

vita, statements of teaching and research philosophy, unofficial graduate transcripts, and three letters of reference online at <https://jobs.eku.edu>. Review of applications will begin 12/15/15. Inquiries should be sent to Daniel Mundfrom, daniel.mundfrom@eku.edu. Eastern Kentucky University in Richmond, Kentucky, is an EOE.

Maryland

■ Applications are invited for a tenure-track assistant professor of statistics for fall 2016. Loyola seeks candidates with a PhD in statistics who can demonstrate the potential for significant scholarly activity and excellence in teaching. To apply, please visit <https://careers.loyola.edu> to submit a cover letter, CV, an essay that includes a statement on research and on teaching philosophy, sample teaching evaluations, and list of references. EOE.

Massachusetts

■ Tenure-track assistant/associate professor, mathematical sciences. Bentley University, a private business university outside Boston, invites applications for

FACULTY POSITIONS IN BIOSTATISTICS



UNC
GILLINGS SCHOOL OF
GLOBAL PUBLIC HEALTH

The Department of Biostatistics at The University of North Carolina at Chapel Hill is seeking applications for up to two tenure-track or tenured positions. The appointments will start in the summer or fall of 2016. Appointments may be at the Assistant, Associate or Full Professor level, depending on qualifications. At least one position will be at the Assistant Professor rank. A doctoral degree in Biostatistics, Statistics or equivalent is required. The focus of the search is on areas of biostatistics related to big data and complex data, including but not limited to electronic health record data, precision medicine, data linkage and integration, machine learning, medical imaging, among other areas. Applicants should have broad research and teaching interests, the potential to direct PhD-level research, and the ability to engage in collaborative research with other faculty members at the University. Review of applications will start in December, 2015. The positions will remain open until filled.

To apply, use the electronic submission website at <http://unc.peopleadmin.com/postings/84247> and upload PDF versions of your CV, cover letter, and research and teaching statements. Candidates must also arrange for four letters of recommendation to arrive via email at bennett@bios.unc.edu addressed to:

Faculty Search Committee

c/o Vera Bennett
Department of Biostatistics
CB #7420, McGavran-Greenberg Hall
University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-7420

The University of North Carolina at Chapel Hill is an equal opportunity and affirmative action employer. All qualified applicants will receive consideration for employment without regard to age, color, disability, gender, gender expression, gender identity, genetic information, race, national origin, religion, sex, sexual orientation, or status as a protected veteran.

a full-time position in applied statistics or related field for fall 2016. Bentley offers degrees in mathematical sciences, actuarial science, MS in business analytics and business. PhD required in applied statistics or a related field by fall 2016. Interested applicants visit: www.bentley.edu. Bentley University is an Equal Opportunity Employer, building strength through diversity.

■ BU mathematics statistics invites applications for a tenured statistics professor. PhD required. Begins 7/1/16, pending final budgetary approval. Strong commitment to teaching and research essential. The ideal candidate would be interested in serving as director, program in statistics. Submit cover letter describing research and teaching interests, CV, contact information for three references: mathjobs.org. Direct questions to Tasso Kaper, tasso@bu.edu. Review begins 11/16/15, continuing until filled. Boston University is an Equal Opportunity Employer and a VEVRAA Federal Contractor.

■ MIT Mathematics Department, Cambridge, MA, seeking to fill positions in statistics at levels of assistant

EOE


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Westat is an employee-owned corporation headquartered in Rockville, Maryland. We provide statistical consulting and survey research to the agencies of the U.S. Government and to a broad range of business and institutional clients. With a strong technical and managerial staff and a long record of quality research, Westat is a leader in the statistical services field.

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Senior Survey Sampling Statistician This position requires a master's degree in survey sampling, statistics, survey research, or a related field with 12 or more years in sample survey work or a Ph.D. in survey sampling, statistics, survey research, or a related field and 10 or more years in sample survey work.

Senior Manager, Statistical Computing Unit This position requires candidates to have a strong statistical or other quantitative background and at minimum a master's degree in computer science, statistics, math, physics, or a related data science degree coupled with at least 10 years of experience in statistical or other data-intensive computing. Five years of supervisory experience is also required.

Statistical Analyst This position requires a master's degree in statistics, survey research, or other related quantitative field coupled with 5 or more years in sample survey analysis or a Ph.D. in statistics, survey research, or other related quantitative field and 3 or more years in sample survey analysis.

Survey Sampling Statistician This position requires a master's degree in survey sampling, statistics, survey research, or a related field with 5 or more years in sample survey work or a Ph.D. in survey sampling, statistics, survey research, or a related field and 3 or more years in sample survey work.

Data Scientist The position requires candidates to have a computational and applied statistical background. At a minimum a master's degree in statistics, survey methodology, computer science, or a related applied quantitative social science field coupled with at least 3 years of experience in statistical computing.

Westat is an Equal Opportunity Employer and does not discriminate on the basis of race, creed, color, religion, sex, age, national origin, veteran status, disability, marital status, sexual orientation, citizen status, genetic information, gender identity, or any other protected status under applicable law. To apply, go to www.westat.com/careers.

www.westat.com



TENURE-TRACK AND TENURED FACULTY POSITIONS DEPARTMENT OF BIostatISTICS AND BIOINFORMATICS ROLLINS SCHOOL OF PUBLIC HEALTH, EMORY UNIVERSITY

The Department of Biostatistics and Bioinformatics in the Rollins School of Public Health at Emory University is recruiting outstanding faculty candidates for at least two positions: a tenure-track Assistant Professor and a tenured Associate/Full Professor. Successful candidates will contribute to active methodologic and collaborative research programs, expand graduate education at the masters and doctoral levels, and serve locally, nationally, and internationally. Applicants with strong potential and experience in all research areas are encouraged, with particular interest areas including big data, environmental and spatial statistics, infectious disease modeling, and neuroimaging statistics.

Ongoing and expanding collaborative opportunities exist throughout the Woodruff Health Sciences Center including the Rollins School of Public Health, the School of Medicine, Nell Hodgson Woodruff School of Nursing, Winship Cancer Institute, Yerkes Primate Center, and the Vaccine Center. Atlanta has been called the 'Public Health Capital of the World' and is home to the U.S. Centers for Disease Control and Prevention, American Cancer Society, CARE, and the Carter Center.

The department has 26 doctoral faculty and 7 masters level associate faculty members with primary appointments. Research interests of the faculty include methods for high-dimensional data such as imaging, genomics and electronic health records; survival analysis; quantile regression; categorical data analysis; missing and mismeasured data; causal inference; Bayesian methods; estimating functions; and spatial statistics. The department collaborates with the Atlanta Clinical and Translational Science Institute (NCATS-supported Clinical and Translational Science Award), the Center for AIDS Research, and the Health and Exposome Research Center. It also

serves as the Data Coordinating Center for several clinical trials, operates the Biostatistics Consulting Center; and houses the Center for Biomedical Imaging Statistics (CBIS). The department offers a PhD program in biostatistics from the Laney Graduate School, and masters degrees in public health and public health informatics. A concentration in bioinformatics, imaging, and genetics is available at the doctoral level.

Successful candidates for both positions must have a doctoral degree and relevant experience in biostatistics, statistics or a related field prior to being appointed to this position. Successful candidates for the senior position must have documented success in research, teaching, and service commensurate for tenure as evaluated by the Appointment, Promotion, and Tenure Committee of the RSPH. To apply, a cover letter stating which position the candidate is applying for (tenure-track or tenured), a statement of research interests, a complete curriculum vitae, and three reference letters should be sent to:

Biostatistics Search Committee (attn to either:

Tenure-track or Tenured), c/o Mary Abosi (mabosi@emory.edu)
Emory University, Department of Biostatistics and Bioinformatics,
1518 Clifton Rd., NE, Atlanta, GA 30322,
<http://sph.emory.edu/departments/bios/index.html>

Applicants must also fill out an application on the Emory Careers Website at <http://www.hr.emory.edu/eu/careers/> under faculty search for Assistant Professor: Posting # 56384BR or Associate or Full Professor: Posting # 56383BR.

Consideration of applications will begin immediately, and applications will be considered until positions are filled. Emory University is an Equal Opportunity/Affirmative Action/Disability/Veteran Employer.



THE FLORIDA STATE UNIVERSITY DEPARTMENT OF STATISTICS

TWO ASSISTANT PROFESSOR POSITIONS IN STATISTICS AND BIostatISTICS (TENURE-TRACK)

The Department of Statistics at Florida State University invites applications for two tenure-track positions in statistics and biostatistics starting August 2016. The Statistics Department has a growing teaching and research program with over 150 graduate students and 19 faculty members. We offer both M.S. and Ph.D. degrees in Statistics and Biostatistics. Candidates with interests in all areas of statistics and biostatistics are invited to apply. A PhD in Statistics, Biostatistics, or a related field is required. Candidates should have strong commitments to excellence in teaching and research.

Applications are being accepted online. Please visit our web site at <http://stat.fsu.edu> to apply and for additional information about the Department of Statistics. Review of candidates will begin November 15, 2015 and continue until the positions are filled.

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professor or higher beginning July 2016 (for 2016–2017 year). Appointments based on exceptional research qualifications; appointees required to fulfill teaching duties. PhD in mathematics or related field required by employment start date. See full classified for online submission for full consideration by December 1, 2015, at www.mathjobs.org. Massachusetts Institute of Technology is an Equal Opportunity Affirmative Action Employer.

■ Statistical Programmer (Cambridge, MA). Develops SAS programs regulatory report submissions & government inquiries re: toxicity & efficacy in drug discovery & development. Min reqs: MSc in stats/biostats/eng. or rel. fld. & 3 yrs exp. w/SAS pgm. in pharma. industry. Req: knowledge (1) FDA EMA submission guidelines; CDISC data standards. Mail resume: Matthew Metivier, HR, Infinity Pharmaceuticals, Inc., 780 Memorial Dr., Cambridge, MA 02139. ref. Code: IPIS15. EOE.

■ MIT Mathematics Department, Cambridge, MA, seeking to fill positions in statistics at level of instructor

FACULTY POSITIONS IN STATISTICAL GENETICS/GENOMICS



UNC
GILLINGS SCHOOL OF
GLOBAL PUBLIC HEALTH

The Departments of Biostatistics and Genetics at The University of North Carolina at Chapel Hill are seeking applications for up to three tenure-track or tenured positions in statistical genetics/genomics, starting in the fall of 2016. Primary appointments will be in the Department of Biostatistics in the Gillings School of Global Public Health, with one of the appointments being joint in the Department of Genetics in the School of Medicine. Appointments may be at the Assistant, Associate or Full Professor level, depending on qualifications. At least one position will be at the Assistant Professor rank. A doctoral degree in Biostatistics, Statistics or equivalent is required. Applicants should have broad research and teaching interests, the potential to direct PhD-level research, and the ability to engage in collaborative research with other faculty members at the University. The successful candidate will join a vibrant group of statistical geneticists in Biostatistics, Genetics and elsewhere at UNC. The University of North Carolina is among the nation's top public research universities, with dynamic programs in biostatistics, genetics, genomics, bioinformatics, biology, epidemiology, medicine, pharmacogenomics, statistics, and toxicology. In addition, UNC has numerous externally funded projects that provide an excellent environment for interdisciplinary research. Review of applications will start in December. The positions will remain open until filled.

To apply, use the electronic submission website at <http://unc.peopleadmin.com/postings/84285> and upload PDF versions of your CV, cover letter, and research and teaching statements. Candidates must also arrange for four letters of recommendation to arrive via email at bennett@bios.unc.edu addressed to:

Faculty Search Committee

c/o Vera Bennett

Department of Biostatistics

CB #7420, McGavran-Greenberg Hall

University of North Carolina at Chapel Hill

Chapel Hill, NC 27599-7420

The University of North Carolina at Chapel Hill is an equal opportunity and affirmative action employer. All qualified applicants will receive consideration for employment without regard to age, color, disability, gender, gender expression, gender identity, genetic information, race, national origin, religion, sex, sexual orientation, or status as a protected veteran.

beginning July 2016 (for 2016–2017 year). Appointments based on exceptional research qualifications; appointees expected to fulfill teaching duties. PhD in mathematics or related field required by employment start date. See full classified for online submission for full consideration by December 1, 2015, at www.mathjobs.org. Massachusetts Institute of Technology is an Equal Opportunity Affirmative Action Employer.

■ Assistant Professor, Department of Biostatistics, Boston University School of Public Health (<http://sph.bu.edu/bio>). Participate in methodological and collaborative research in exciting areas such as statistical genetics, clinical trials, and observational studies. PhD in biostatistics or equivalent required. Email CV, letter of intent including career objectives, research and teaching experience, interests, and goals, and three letters of recommendation to chary@bu.edu. Boston University is an EOE.

■ Boston University Mathematics and Statistics Department invites applications for tenure-track statistics assistant

professor. PhD required. Begins July 2016, pending final budgetary approval. Commitment to research and teaching both undergraduate and graduate level essential. Submit cover letter, CV, research statement, teaching statement, and four recommendation letters, (one teaching): mathjobs.org. Alternatively, submit materials: Statistics T-T Search, Mathematics/Statistics, Boston University, 111 Cummington Mall, Boston, MA 02215. Deadline 12/1/15. Boston University is an Equal Opportunity Employer and a VEVRAA Federal Contractor.

■ Boston University Mathematics and Statistics invites applications for a tenured statistics associate professor. PhD required. Begins 7/1/2016, pending final budgetary approval. Strong commitment and record of teaching and research essential. Submit cover letter, CV, research statement, teaching statement, and four recommendation letters (one teaching) to mathjobs.org. Alternatively, submit materials to: Statistics ASCP Search, Mathematics/Statistics, Boston University, 111 Cummington Mall, Boston, MA 02215. Deadline 12/1/2015.

ACADEMIA SINICA

INSTITUTE OF STATISTICAL SCIENCE

Regular Research Positions

The Institute of Statistical Science, Academia Sinica, is seeking candidates for tenure-track or tenured research positions at the level of assistant, associate or full research fellow available in 2016. Candidates in all areas of Statistics will be considered. Candidates should have a PhD degree in statistics or areas related to data science. Application materials must include (1) a curriculum vitae, (2) three letters of recommendation, and (3) representative publications and/or technical reports. Additional supporting materials such as transcripts for new PhD degree recipients may also be included. Except for the letters of recommendation, electronic submissions are encouraged. Applications should be submitted to:

Dr. Hsin-Cheng Huang
Chair of the Search Committee
Institute of Statistical Science, Academia Sinica
128 Sec. 2 Academia Road, Taipei 11529, Taiwan,
R.O.C.
Fax: +886-2-27831523
E-mail: hchuang@stat.sinica.edu.tw

Applications should be received by December 30, 2015 for consideration.

PRANAB K. SEN DISTINGUISHED VISITING PROFESSORSHIP



UNC
GILLINGS SCHOOL OF
GLOBAL PUBLIC HEALTH

The Department of Biostatistics at the University of North Carolina at Chapel Hill (UNC-CH) is seeking to recruit an aspiring international scholar in statistical science for the Pranab K. Sen Distinguished Visiting Professorship in Biostatistics. The position is for the fall semester beginning August 2016 for a period lasting up to five months. Preference will be given to applicants from developing countries as defined by the Departments of Biostatistics and Statistics and Operations Research and in consort with the dean of the Gillings School of Global Public Health. The visiting faculty, who will come from an area of statistical science, broadly defined, including bioinformatics, will come to UNC-CH to conduct research, possibly teach, and interact with faculty, students, and the university community. The major benefit will be an intensive interaction of the visitor's strong methodology background with applications to interdisciplinary research underway at UNC-CH. The visiting professorship, at the assistant, associate or full professor level, offers salary support commensurate with the rank. Financial support for other expenses such as travel is negotiable. Ideally, the visiting scholar will return to his or her home country for at least one year upon completing the appointment to further expand the reach of interdisciplinary work begun in Chapel Hill. Applicants should hold a PhD in statistics or biostatistics or have commensurate educational background.

To apply, upload your CV, cover letter, and research statement in the application at <http://unc.peopleadmin.com/postings/79598>. Candidates must also arrange for three letters of recommendation to arrive via email to Betsy Seagroves (bseagro@bios.unc.edu). The deadline for applications is March 1, 2016.



ASSISTANT/ASSOCIATE BIOSTATISTICIAN FACULTY POSITIONS

**Department of Epidemiology and Biostatistics
The University of Texas Health Science Center at San Antonio,
San Antonio, TX**

The Department of Epidemiology and Biostatistics (DEB) at The University of Texas Health Science Center at San Antonio (UTH-SCSA) seeks two experienced, doctorate-level faculty biostatistician for two tenure-track faculty positions at the rank of Assistant or Associate Professor. Candidates are expected to have expertise in longitudinal data, survival analysis, methods for large healthcare databases, statistical genomics applied to clinical outcomes, or clinical trial design. These positions provide an opportunity to collaborate with a multidisciplinary research team as well as to lead independent methodological research in a setting with access to a large, ethnically diverse population. The UTHSCSA is situated in the dynamic city of San Antonio; a wonderful place to live and work that is rich with both culture and history.

The DEB at UTHSCSA has 20 full-time faculty and 46 staff with a number of additional affiliate faculty. Research interests of the faculty include translational science, clinical- and population-based investigation, the application of epidemiological and biostatistical principles to clinical problem solving, formulation of health policy, and the development of new epidemiological and statistical methods for clinical trial design, analysis of "Big Data", clinical decision support systems, and statistical genomics.

The mission of the DEB is to develop and enhance population-based, clinical and translational research in clinical and community settings, to develop epidemiologic, biostatistical and medical informatics resources, and to promote the educational mission of the School of Medicine by teaching epidemiology, biostatistics, and critical appraisal of the medical literature to students, house-staff, and faculty. The DEB is also the home of the Biostatistics and Informatics Core which includes faculty and Masters trained researchers who serve the UTHSCSA, along with public, community, and private health entities by providing data management, biostatistical and epidemiological support for projects and programs that involve clinical or health data.

The DEB plays an integral role in UTH-SCSA's research and educational missions by enhancing the programs to prevent disease, to promote health, to deliver quality health

care, and to inform health policy decisions. Depending on the research interests of the selected candidate, there are opportunities to collaborate with colleagues within the medical, nursing, and dental schools as well as other health sciences departments. For candidates interested in cancer research, there are research opportunities with the Cancer Therapy Research Center (CTRC), one of four NCI-designated Cancer Centers in Texas and the only NCI designated center in South Texas. The Department also has strong research and educational collaborations with the San Antonio Regional Campus of The University of Texas School of Public Health.

These positions are tenure-track and a 12-month appointment. Appointments are open rank (Assistant or Associate level). Preference will be given to someone with a demonstrated ability to both collaborate on multidisciplinary research teams and to successfully lead their own research program. Applicants must have a doctoral degree (PhD or equivalent) in Biostatistics or Statistics, excellent communication skills, and a strong interest in interdisciplinary collaboration.

Review of applications will begin immediately and continue until the positions are filled. Salary will be commensurate with qualifications. Information about the DEB is available here: <http://deb.uthscsa.edu/>. For full consideration applicants should send electronically or via mail: 1) a cover letter stating career goals and the relevance of the candidate's training and experience to the position; 2) a current CV; 3) a personal statement describing the candidate's research plan and teaching experience; and 4) names and contact information of three references to gelfondjal@uthscsa.edu or by mail to: Jonathan Gelfond, M.D., Ph.D., Associate Professor and Biostatistics Search Committee Chair, UT Health Science Center at San Antonio, Department of Epidemiology and Biostatistics, 7703 Floyd Curl Dr.--MSC 7933, San Antonio, TX 78229-3900.

All faculty appointments are designated as security sensitive positions. The University of Texas Health Science Center at San Antonio is an Equal Employment Opportunity/Affirmative Action Employer including protected veterans and persons with disabilities.

Boston University is an Equal Opportunity Employer and a VEVRAA Federal Contractor.

Michigan

■ Grand Valley State University invites applications for assistant professor of statistics. Qualifications include a PhD in statistics or related field, evidence of commitment to teaching excellence and active scholarship. For information regarding application materials, see our complete position description at www.gvsu.edu/stat. Applications only accepted online at www.gvsujobs.org; review of candidate materials begins on November 20, 2015. GVSU is an affirmative action, equal opportunity institution.

Missouri

■ Assistant/associate professor, statistics department, University of Missouri, tenure-track assistant/associate position; all areas of statistics are encouraged to apply. PHD in statistics required by August 15, 2016. Apply online at <http://hrs.missouri.edu/find-a-job/academic>. Upload cover letter, CV, research & teaching statements. Deadline: December 1, 2015. Have three letters of recommendation sent to hrs.missouri.edu/find-a-job/academic. The University of Missouri is an Equal Opportunity/Affirmative Action/ADA Employer.

New Hampshire

■ The mathematics department at Southern New Hampshire University (SNHU) seeks candidates for two positions as assistant professor of mathematics beginning September 1, 2016. The successful candidates will help build upon the recent launch of new majors and minors in math and math education. Candidates should be passionate about teaching undergraduates. A PhD in mathematics/statistics with at least 18 graduate hours. Apply Here: www.Click2Apply.net/9g9t5h6xqc. EOE.

New Jersey

■ The department of statistics and biostatistics and the Center for Integrative Proteomics Research at Rutgers University seeks to hire a tenure-track assistant or associate professor with strong research and teaching interests in statistical analyses of biological and biomedical information. Applicants must

have a PhD in statistics or related field by Sept. 1, 2016. Apply online through the Rutgers Interfolio website link (<http://apply.interfolio.com/31548>). AA/EOE.

New Mexico

■ Assistant professor of applied statistics. The department of economics, applied statistics, and international business at New Mexico State University invites applications for a tenure-track assistant professor of applied statistics, 9-month position. Doctorate required. Specialty in data analytics preferred. Other fields considered. Position requires graduate and undergraduate teaching, research, and service. For full position announcement, see jobs.nmsu.edu/postings/23210. EOE.

New York

■ NYU Stern School of Business Statistics Group, tenure-track assistant professor appointment in statistics. Candidates should have evidence of boundary-spanning interests across fields that reflect significant interfaces of statistics with areas of relevance in a business school. Expected that candidate will be productive researcher and effective teacher at both undergraduate and graduate levels. See apply.interfolio.com/30831 for full details, including information on application procedure. EOE.

Ohio

■ The Ohio State University Department of Statistics invites applications for an open-rank faculty/program specialist position beginning autumn 2016. This nontenure-track faculty position provides teaching and program support in the university's new undergraduate data analytics major, with focus on enhancement of student learning in statistics and analytics. PhD in statistics and excellence in teaching are required. Apply by November 29, 2015, at academicjobsonline.org/ajol/jobs/6046. To build a diverse workforce, Ohio State encourages applications from minorities, veterans, women, and individuals with disabilities. Flexible work options available. EEO/AA Employer. The Ohio State is an NSF Advance Institution.

Pennsylvania

■ The Wharton Department of Statistics, University of Pennsylvania, is seeking full-time, tenure-track faculty at any

DEPARTMENT OF STATISTICS

Columbia University

Faculty Positions Starting Fall 2016

The Department of Statistics invites applications for two faculty positions in applied/interdisciplinary statistics to begin July 1, 2016. The positions may be filled at any rank from tenure-track assistant professor through full professor with tenure. A Ph.D. in statistics or a related field and commitment to high quality research and teaching in statistics and/or probability are required. Candidates will be expected to sustain an active research and publication agenda and to teach in the departmental undergraduate and graduate programs. Candidates interested in an affiliation with the Data Science Institute are strongly encouraged to apply.

The Department currently consists of 30 faculty members, 45 PhD students, and over 200 MA students. The Department has been expanding rapidly and, like the University itself, is an extraordinarily vibrant academic community. For further information about the Department and our activities, centers, research areas, and curricular programs, please go to our webpage at: <http://www.stat.columbia.edu>

For information about the Data Science Institute, please see web page at: <http://datascience.columbia.edu>

Applicants at all ranks are required to create an applicant profile and upload a CV through Columbia's online Recruitment of Academic Personnel System (RAPS). To begin the application process, please go to: <https://academicjobs.columbia.edu/applicants/Central?quickFind=61490>

Additionally, applicants must submit materials through Head Hunter. To apply for the senior position go to this link https://editorialexpress.com/apply/columbia_statistics_senior_recruiting_2016_a89.

To apply for the junior position go to https://editorialexpress.com/apply/columbia_statistics_junior_recruiting_2016_a90

The Department of Statistics positions will be visible in Head Hunter by clicking on "Positions" after logging in to the Candidate Application Interface.

In Head Hunter, applicants for this position at the assistant professor or non-tenured associate professor rank should submit a cover letter, Curriculum Vitae, a brief statement of their research plans, one writing sample, and arrange for three letters of reference to be sent on their behalf. Applicants at the tenured associate professor and full professor rank should submit a cover letter and Curriculum Vitae.

Applications will only be considered for the position once the process is completed both in RAPS and in HEAD HUNTER.

Inquiries may be made to dk@stat.columbia.edu

Review of applications begins on December 2, 2015, and will continue until the position is filled.

Columbia University is an Equal Opportunity/Affirmative Action employer.

■ Tenure-track assistant professor position in statistics or biostatistics beginning fall 2016 (www.math.ttu.edu/FacultyStaff/stat-ad.shtml). A PhD is required. Apply for requisition ID5154BR at www.texastech.edu/careers. Have three letters of reference sent to Misty Rangel, Department of Mathematics and Statistics, Texas Tech University, Lubbock, TX 79409-1042. As an Equal Employment Opportunity/Affirmative Action employer, Texas Tech University is dedicated to the goal of building a culturally diverse faculty committed to teaching and working in a multicultural environment. We actively encourage applications from all those who can contribute, through their research, teaching, and/or service, to the diversity and excellence of the academic community at Texas Tech University. The university welcomes applications from minorities, women, veterans, persons with disabilities, and dual-career couples.

Utah

■ The department of mathematics at the University of Utah invites applications for the following faculty positions: Full-time tenure-track or tenured appointments at the level of assistant, associate, or full professor in all areas of statistics. Applications must be completed through the website www.mathjobs.org/jobs/Utah, and will be accepted until the position(s) have been filled. For more information, see www.math.utah.edu/positions. The University of Utah is an Equal Opportunity/Affirmative Action employer and educator. Minorities, women, veterans, and those with disabilities are strongly encouraged to apply. Veterans' preference is extended to qualified veterans. Reasonable disability accommodations will be provided with adequate notice. For additional information about the university's commitment to equal opportunity and access, see www.utah.edu/nondiscrimination.

Virginia

■ Manager, Research Initiatives (Alexandria, VA). This position is new to the Club Managers Association of America and expected to produce high-quality research products to drive greater member value. Currently, the association conducts one annual survey process that produces 2–3 reports. This position is responsible for growing our report frequency to

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Your work as a Mathematical Statistician at the Census Bureau

- Design sample surveys and analyze the data collected.
- Design and analyze experiments to improve survey questionnaires and interview procedures.
- Improve statistical methods for modeling and adjustment of seasonal time series.
- Perform research on statistical methodology that will improve the quality and value of the data collected.
- Publish research papers and technical documentation of your work

Requirements

- U.S. citizenship
- Bachelor's, Master's or Ph.D with at least 24 semester hours in math and statistics (see website for more specifics on required coursework)

Apply at www.census.gov, click on Jobs@census, Headquarters and NPC Employment Opportunities, Mathematical Statistician

The U.S. Census Bureau is an Equal Opportunity Employer.

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Economics and Statistics Administration,
U.S. Census Bureau

DEPARTMENT OF STATISTICS

Columbia University

Limited-term Faculty Position Starting Fall 2016

The Department of Statistics invites applications for a four-year term position at the rank of assistant professor to begin July 1, 2016. A PhD in statistics or a related field is required, as is a commitment to high quality research and teaching in statistics and/or probability. Candidates will be expected to sustain an active research and publication agenda and to teach in the departmental undergraduate and graduate programs.

The department currently consists of 30 faculty members, 45 PhD students, and over 200 MA students. The department has been expanding rapidly and, like the University itself, is an extraordinarily vibrant academic community. For further information about the department and our activities, centers, research areas, and curricular programs, please go to our web page at: <http://www.stat.columbia.edu>

All applications must be submitted through Columbia's online Recruitment of Academic Personnel System (RAPS) and must include the following materials: cover letter, curriculum vitae, statement of teaching philosophy, research statement, evidence of teaching effectiveness, one writing sample or publication, and the names of 3 references into the system. Applicants also should arrange for three letters of recommendation to be uploaded on their behalf. For more information and to apply, please go to: <https://academicjobs.columbia.edu/applicants/Central?quickFind=61471>

Inquiries may be made to dk@stat.columbia.edu

Review of applications begins on January 1, 2016, and will continue until the position is filled.

Columbia University is an Equal Opportunity/Affirmative Action employer.

10–12 annual projects. jobs.amstat.org/jobs/7482119/manager-research-initiatives. CMAA provides equal employment opportunities (EEO) In addition to federal law requirements, CMAA complies with applicable state and local laws governing nondiscrimination in employment in every location in which the company has facilities.

■ Department of statistics, University of Virginia, invites applications for one tenure/tenure-track position and one lecturer, fall 2016. Applicants must present evidence of outstanding accomplishments in research/teaching. Candidates are expected to teach graduate/undergraduate courses, provide service. We seek candidates dedicated to UVA's mission of excellence in research and teaching. We expect substantial growth due to UVA President's Big Data Initiative. Application instructions: statistics.as.virginia.edu EO/AA Employer. ■

NC STATE UNIVERSITY

Tenure-Track Faculty Positions

The Department of Statistics at North Carolina State University invites applications for three tenure track positions to begin in August 2016: one Assistant Professor and two open-rank positions. For outstanding candidates, the open-rank positions may be combined with named professorships.

Applicants must have a Ph.D. in Statistics or Biostatistics. Responsibilities include teaching, research, and doctoral student research supervision. Candidates for Associate or Full Professor must have an established record of funded research, collaboration, and exemplary teaching.

To apply for the Assistant Professor position, go to <https://jobs.ncsu.edu/postings/55131>, and for the open-rank positions, go to <https://jobs.ncsu.edu/postings/55266>.

Questions may be directed to the Search Chair, Dr. Ana-Maria Staicu (stat_search@stat.ncsu.edu).

Non-Tenure Track Faculty Position - Teaching Assistant Professor

The Department of Statistics at North Carolina State University invites applications for a non-tenure track position at the Assistant Professor level to begin in August 2016.

Applicants must have a Ph.D. in Statistics or Biostatistics. Experience and excellence in teaching is required. The initial appointment is expected to be for two years, but the position is eligible for subsequent appointments, and promotions in rank are possible.

To apply, go to <https://jobs.ncsu.edu/postings/53972>. Questions may be directed to the Search Chair, Dr. Roger Woodard (teach_stat_search@stat.ncsu.edu).

Inclusiveness and diversity are academic imperatives and thus are university goals. Please visit <http://www.stat.ncsu.edu> for information about the Department. Processing of applications will begin November 20, 2015 and continue until the positions are filled.

NCSU is an equal opportunity and affirmative action employer. In addition, NC State University welcomes all persons without regard to sexual orientation or genetic information.

University of Rochester **Department of Biostatistics and Computational Biology** **Tenure-Track Faculty Position (Open Rank)**

The Department of Biostatistics and Computational Biology (DBCBC) at the University of Rochester invites applications for an open rank tenure-track position. The successful candidate will be expected to have developed an active program in methodological research, contribute to our Ph.D. program through teaching and advising graduate students, and have a major role in collaborative research with the Department of Neurology and the Center for Human Experimental Therapeutics (CHET). A key component of this position will involve working with investigators throughout North America in the design and analysis of high profile clinical trials in neurological disorders; we are especially interested in applicants that have a track record of relevant methodological and collaborative clinical research.

DBCBC, Neurology and CHET have a long-standing collaborative relationship with each other; faculty play leadership roles in national and international groups conducting multi-center clinical trials and epidemiological studies in Parkinson's disease, Huntington's disease, and other neurologic disorders.

Position Qualifications: Doctoral degree in biostatistics, statistics or strongly related discipline. Candidates must have excellent oral and written communication skills. Candidates for Associate and Full Professor positions should also have

an established track record of peer-reviewed publications, have demonstrated success in attracting extramural research funding, and present evidence of teaching excellence at the graduate level.

To apply: Candidates should send a cover letter, CV, and 3 letters of reference to the address below. The cover letter should specifically address the candidate's expertise in areas directly relevant to this position. Review of candidate files will commence December 1, 2015. Please email all materials in a single PDF file to BSTFacultySearch@urmc.rochester.edu to ensure timely consideration of your application. Candidates preferring to send hard copies should mail these to the following address:

Open Rank Faculty Position (Neuro)
c/o Malora Zavaglia
University of Rochester Medical Center
Department of Biostatistics & Computational Biology
601 Elmwood Avenue, Box 630
Rochester, NY 14642

The University of Rochester is an Affirmative Action, Equal Opportunity institution. Women and minority candidates are strongly encouraged to apply.



PennState
Eberly College of Science

The Department of Statistics at The Pennsylvania State University invites applications (and nominations) for a senior-level tenured full professor position. Candidates with an exceptional record of achievement and research leadership in any area of statistics and with credentials appropriate to a tenured full professorship will be considered. The successful candidate will be expected to take an active role of intellectual leadership in the department.

The Statistics Department is part of the Eberly College of Science at Penn State, which accounts for over one hundred million dollars of research expenditures annually. A conservative analysis of the most recent National Research Council (NRC) data for basic science programs at research universities places Penn State Science clearly in the top ten in the United States. The Statistics Department itself has more than 25 tenure-line faculty members and more than 40 faculty members total, engaged in a wide variety of teaching and research. The research activity is both theoretical and applied, with collaborative ties to other departments in the College of Science (e.g., biology and astronomy) as well as other colleges across the university (e.g., Earth and Mineral Sciences, Engineering, Health and Human Development, and Medicine). Multiple institutes at Penn State (e.g., the Huck Institutes of Life Sciences, Penn State Institutes of Energy and the Environment, and the Institute for Cyberscience) support inter-disciplinary research and involve multiple statistics faculty members in collaborative research.

FULL PROFESSOR POSITION AT PENN STATE UNIVERSITY

Penn State is located in the center of Pennsylvania, in a valley surrounded by the Appalachian Mountains and state forestland. The adjoining town of State College combines many amenities typically found in large metropolitan areas with the benefits of a small town boasting a highly educated population.

Additional information about the department can be found at <http://www.stat.psu.edu/>. Informal inquiries about and/or nominations for this position may be directed to Prof. David Hunter, Department Head, at dhunter@stat.psu.edu. Applicants must apply online and complete the Penn State application at <http://psu.jobs/> (search job #58612) and must apply online and submit application materials, including cover letter and CV, through [mathjobs.org](https://www.mathjobs.org) (<https://www.mathjobs.org/jobs>).

CAMPUS SECURITY CRIME STATISTICS: For more about safety at Penn State, and to review the Annual Security Report which contains information about crime statistics and other safety and security matters, please go to <http://www.police.psu.edu/clery/>, which will also provide you with detail on how to request a hard copy of the Annual Security Report.

Penn State is an equal opportunity, affirmative action employer, and is committed to providing employment opportunities to all qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national origin, disability or protected veteran status.



TEXAS TECH UNIVERSITY

Department of Mathematics & Statistics

TEXAS TECH UNIVERSITY

Department of Mathematics and Statistics

Chair and Professor

The Department of Mathematics and Statistics at Texas Tech University invites applications for the position of Department Chair and Professor beginning fall 2016. The salary will be competitive and commensurate with qualifications and experience.

Candidates must have demonstrated outstanding vision, leadership, and scholarship, possess strong commitments to interdisciplinary research and educational activities, and be a collegial motivator and advocate for faculty. A Ph.D. in mathematics or statistics is required. The successful candidate is expected to work with the faculty to develop the department under a strategic vision, foster excellence in research and teaching, and provide appropriate service to the college, university, and profession.

The department currently has 45 full-time faculty members with active research groups in pure and applied mathematics and statistics. Six degrees are offered: B.A., B.S., M.A., M.S., and Ph.D. in Mathematics and M.S. in Statistics, as well as several interdisciplinary and combined undergraduate and graduate degrees. For further information regarding the Department of Mathematics and Statistics, please refer to the department's website: <http://www.math.ttu.edu>.

Texas Tech University, located in west Texas in the city of Lubbock, was founded in 1923. The student population is 35,000 and is anticipated to grow to 40,000. Texas Tech is a state-designated national

research university. Its strategic plan charts a course for becoming a great public research university by 2020. The university has the characteristics of a Carnegie-classified doctoral granting university with very high research productivity.

Applicants should apply at <http://www.texastech.edu/careers/> using Requisition 4369BR. Applicants should submit a detailed letter of application along with a current resumé including externally-funded research, teaching, administrative experience, publications, and four letters of professional reference. Questions about the position and/or the application process can be directed to mathchairsearch@ttu.edu

Review of applications will begin immediately. Applications will be accepted until the position is filled, with those received prior to November 15, 2015, assured full consideration.

As an Equal Employment Opportunity/Affirmative Action employer, Texas Tech University is dedicated to the goal of building a culturally diverse faculty committed to teaching and working in a multicultural environment. We actively encourage applications from all those who can contribute, through their research, teaching, and/or service, to the diversity and excellence of the academic community at Texas Tech University. The university welcomes applications from minorities, women, veterans, persons with disabilities, and dual-career couples.

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ASA The American Statistical Association

Heard at the office: "A statistician is a mathematician broken down by age and sex." What is your favorite #statjoke?



AmStat Philadelphia @amstatphilly

Q: What do you call 1000 statisticians at a tea party?

A: A Z-Party

Apothicaire Amoureux @PotardDechaine

"How is your wife?" Statistician: "Compared to what?"

Next month,
we'll ask our followers
to fill in the blank:
As a statistician, I am
thankful for_____.

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Shayantani Pal I married a guy who begins with R

Rose Saint Fleur-Calixte We are mean lovers

Milo Rodriguez Statistics may be dull
bit it has its moments

Robbie Emmet Two proportions had an
argument; they were at odds.

Matt Baron This one is variable (insert your
own number that follows): 42.75 of all
statistics are made up on the spot.

Statistics

The release of SAS/STAT® 14.1 brings you even more statistical techniques for your data analysis needs.

SAS/STAT 14.1
Highlights

Generalized additive models by penalized likelihood estimation. Apply this technique, which provides automatic model selection by optimizing model fitting criteria, to your large data problems.

Imputation for survey data. Employ single and multiple hot-deck and fully efficient fractional imputation methods to handle nonresponse.

Analysis for spatial point patterns. Understand locations of random events, such as crimes or lightning strikes, and how other spatial factors influence event intensity.

Weighted GEE methods. Deal with dropouts in longitudinal studies with a method that produces unbiased estimates under the missing-at-random (MAR) assumption.

Proportional hazards regression models for interval-censored data. Apply these popular regression models in survival analysis when the data are interval-censored.

Additional model selection methods. Use the LASSO method for selecting generalized linear models or the group LASSO method for selecting general linear models.

Classification and regression trees. Use familiar modeling syntax to specify trees and display results with ROC plots as well as tree diagrams.

Bayesian choice models. Use Bayesian discrete choice models to model consumer decisions in choosing products or selection from multiple alternatives.

Item response models. Calibrate test items and evaluate respondents' abilities with item response models.

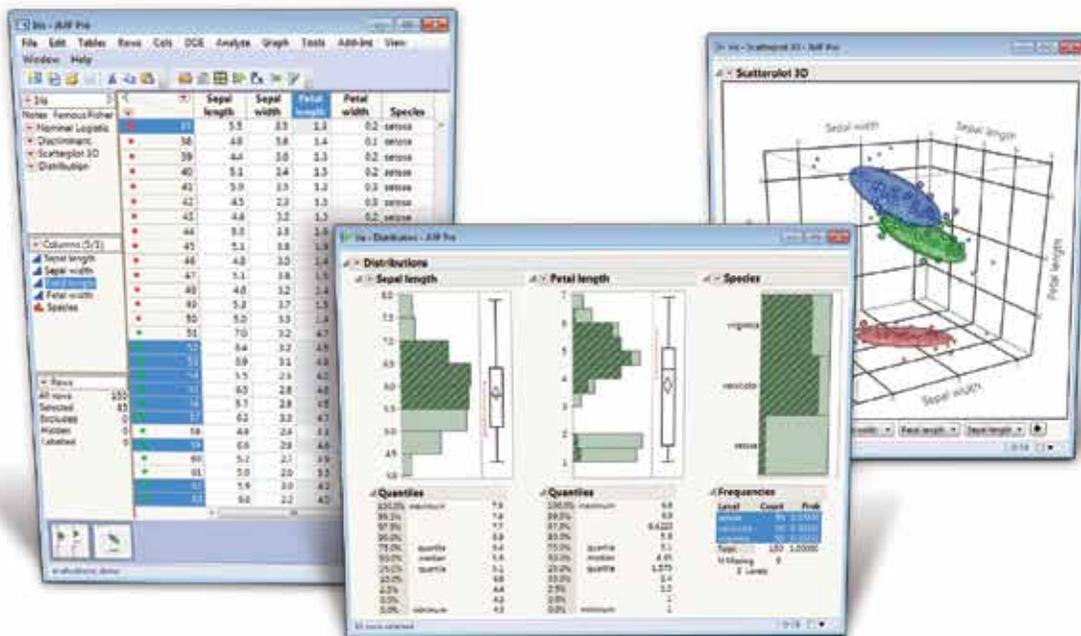
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Highlights



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