November 2021 • Issue #533

AMSTATNEWS

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

2020 Master's Graduates

LAND ON FEET DESPITE COVID-19

ALSO:

Jeffrey T. Leek Wins COPSS Presidents' Award

Transportation Statistics Interest Group Invites New Members

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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.

features

3 President's Corner

5 Editors Wanted for ASA Publications

6 Transportation Statistics Interest Group Invites New Members

7 Statistical Significance Competition Sees Many Winners

8 My ASA Story: Emily Griffith, Associate Research Professor

9 My ASA Story: Sharon Hessney, Educator

10 Career Development Committee Hosts Free Professional Networking Event

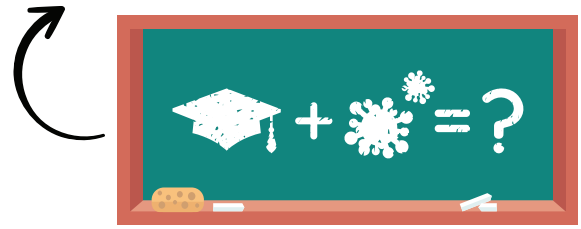
10 Significance Covers COVID-19, Social Media, Rain-Predicting Tortoises

11 COPSS Honors 13 with Awards

12 Jeffrey T. Leek Wins COPSS Presidents' Award

14 The JEDI Corner: Statistics for Equity: Capturing, Not Masking, Intersectional Dynamics in Data

16 2020 Master's Graduates Land on Feet Despite COVID-19



columns

23 **STAT*tr@k***
How to Navigate Data Science Career Opportunities Like a Pro

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

24 **STATS4GOOD**
UN International Computing Centre Supports Global D4G Projects

This column is written for those interested in learning about the world of Data for Good, where statistical analysis is dedicated to good causes that benefit our lives, our communities, and our world. If you would like to know more or have ideas for articles, contact David Corliss at *davidjcorliss@peacework.org.*

Check Out This Winning Logo

The Justice, Equity, Diversity, and Inclusion (JEDI) Outreach Group held a logo contest in early May to find an emblem that reflects the JEDI mission. The winning design was created by Alyssa Columbus, a NASA datanaut and founder of R-Ladies Irvine.

Student Paper Competitions Help Pay for Travel

The winners of student paper competitions earn travel awards to ASA-sponsored conferences. The following general policies and procedures apply to all ASA section competitions (see individual sections for further instructions):

- Sections must receive all materials by December 15. (Some sections have earlier deadlines, so check each section's website for dates.)
- Winners will be notified by January 15.
- JSM best paper competition winners must submit abstracts and register for JSM through the official JSM abstract submission system by the deadline.
- Students may submit papers to no more than two sections and may accept only one section's award. Students must inform both sections applied to when he or she wins and accepts an award, thereby removing themselves from the award competition for the second section.
- Students planning to participate in section competitions must adhere to the eligibility, paper format, submission process, and other requirements of the sections to which they are applying.

Visit *www.amstat.org/ASA/Your-Career/Student-Paper-Competitions.asp* for a list of sections offering awards and detailed instructions and deadlines.

CORRECTION

Due to a transcription error, the tables in last month's article titled, "2020 Bachelor's Degree Recipients in Statistics Show Resilience," were incorrect. Corrected tables appear on the *Amstat News* website at *magazine.amstat.org/blog/2021/10/01/bachelors-degree-statistics*.

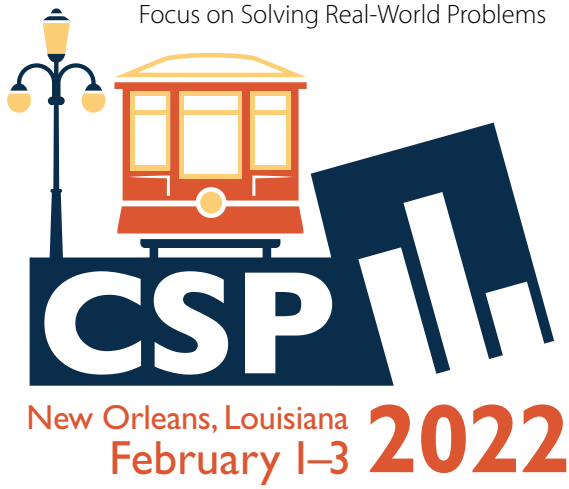
departments

26 **statistician's view**

Response to 'Demystifying Apportionment Computations for the US House of Representatives'

28 **meetings**

CSP 2022 to Take Place in New Orleans, Focus on Solving Real-World Problems



member news

29 People News

34 Awards and Deadlines

35 Section • Chapter • Committee News

43 Professional Opportunities

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There are Mentors, and Then There Are Guardian Angels

Photo/Steve Everett

Rob Santos

I never really had someone I could call a mentor—a senior-level career person who over the course of my career could be an occasional sounding board and source of sage advice. I did have a couple of short-term mentors. These are folks who, say, over a summer or a semester of grad school selflessly gave of themselves to advise and guide me as a deer-in-the-headlights student who "didn't know what he didn't know." Such short-term guidance helped me greatly.

Speaking of short-term mentors, the late demographer and urban planning researcher Leo Estrada quickly comes to mind. I mentioned him in my February column as someone who "showed me the ropes" during my first JSM in 1979 and graciously introduced me to many attending statisticians at mixers and sessions. Without his encouragement and guidance during that conference in Washington, DC, I may well have left statistics altogether. The emotional trauma I experienced is not something I can forget. But Leo helped me overcome that, and here I am today. In a real sense, he acted as a "guardian angel," providing what I needed at exactly the time I needed it so I could embrace my vulnerabilities and move on.

There are other types of guardian angels, too. In 2006, I experienced one of the greatest honors of my career by receiving the ASA Founder's Award. It came out of nowhere; I had no idea I was even being considered for such recognition, even at the awards ceremony. (I was just instructed to be sure I attended the ceremony that night.) What I hadn't realized was great leaders like Fritz Scheuren and the other members of the Founders Award Committee were aware of me, my career accomplishments, and my contributions to our beloved association over the years.

What was more surprising is that my first professional encounter with Fritz was disappointing. He was an associate editor of the *Journal of Business & Economic Statistics* (if memory serves correct) in the early 1980s and had secured a commitment from me to review a manuscript as a referee. Well, the assignment almost immediately fell off my radar and I never completed it. I apologized to Fritz after it was too late and promised that would not happen again if he ever needed me to do a review in the future. He politely responded with something like, "We'll see." I was sure I'd appear on his 'unreliable' list for the rest of my career. But as we all know, Fritz is a much greater human being than that, and he and the other members of the award committee

saw fit to bestow upon me the Founders Award a couple decades later.

What really struck me about this episode was that we as a statistical community don't need to have close connections with others to reinforce each other's value to our community and to offer support and recognition. It is not mentoring in any sense of the word. Instead, it reflects a different type of helping and community-building—being a guardian angel, a tutelary, a guardian of our statistical galaxy. Call it what you want.

I would like to think we have an obligation to look out for each other, even if we do not know each other personally. This can happen in ways such as nominating a person to be on a committee or run for office, especially if that person is an early or mid-career statistician. Or even asking someone to review a piece of work when they are actively building knowledge in that area.

This actually happened to me a couple years ago when fellow ASA member Bill O'Hare asked me to review research he completed on the association between decennial census self-response rates and net under-coverage of demographic subpopulations. The review benefitted me in terms of knowledge gain much more than the feedback I provided to him, and I expect Bill understood that (Thank you, Bill!).

On countless occasions, I have been contacted by a colleague seeking to hire a statistician and immediately informed a handful of folks about the opportunity in case they were interested in career advancement. And over the years, I have forwarded many a résumé to hiring decision-makers on behalf of folks who asked me to "keep a look out for anything interesting." This has been at all levels—from research assistant to president of an organization. I have also forwarded newly released research to folks I knew were interested in the topic. Even these little actions help promote a community that reinforces itself by helping each other. I will note I have shamelessly helped "rival" organizations find new hires and passed along new research findings to them. To me, when our statistical community is strengthened, we all benefit. After all, there is nothing wrong and everything right about helping each other.

And of course, being a guardian angel can and should extend beyond our statistical community. It is rewarding to provide statistical services to local, regional, and/or national organizations whose missions are to help communities and people

I worked with Feeding America for almost 15 years, applying my statistical thinking to the challenges of addressing hunger in America. It was one of the most rewarding experiences of my life. In the 1980s, I helped Southwest Voter Registration and Education Project in San Antonio design and conduct exit polls of Latinx voters. I've advised and mentored early-career policy researchers in a variety of organizations, regardless of whether they wanted to be statisticians. Building community is foundational to creating a better society.

I'll leave you once again with the thought that building community is critical for us, both in our statistical community and in society more generally. Yes, we can be mentors, but we can and should also be guardian angels. Note that being a guardian angel requires you to be aware of your colleagues and fellow association members. Please continue to grow your networks so the full power and effect of your efforts can be realized. Remember, striving to be the best human being you can be by embracing and living your values can make you a better statistician and facilitate a full, rewarding career. So, think about how you can be a more effective guardian angel!

Editors Wanted for ASA Publications

The ASA's publications are vital to the ASA's mission of promoting the practice and profession of statistics, and editors are at the heart of ensuring our publications continue to be world leaders in statistics research and applications.

If you or someone you know would be a great fit for one of the following editorships, send your application or nomination to ASA Journals and Publications Manager Eric Sampson at *eric@amstat.org* by January 7, 2022.

Co-Editors

Journal of the American Statistical Association, Theory and Methods

Term: *2024–2026, with a full year transition beginning January 2023*

Established in 1888 and published quarterly in March, June, September, and December, the *Journal of the American Statistical Association* (*JASA*) has long been considered a premier journal of statistical science. The Theory and Methods section publishes articles that make original contributions to the foundations, theoretical development, or methodology of statistics and probability. *JASA* Theory and Methods receives approximately 900 original submissions a year and has an acceptance rate of about 10 percent.

Editor

Journal of the American Statistical Association/The American Statistician Reviews

Term: *2023–2025, with the transition beginning July – September 2022*

The reviews section in *JASA* publishes all review-type articles and reviews of recently published books relevant to the *JASA* audience. The reviews section in *The American Statistician* publishes reviews of materials related to teaching statistics, including textbooks; special volumes and proceedings concerning statistical education; software, videotapes, organized sources of data, and internet resources intended for statistical education; and other similar items. ■

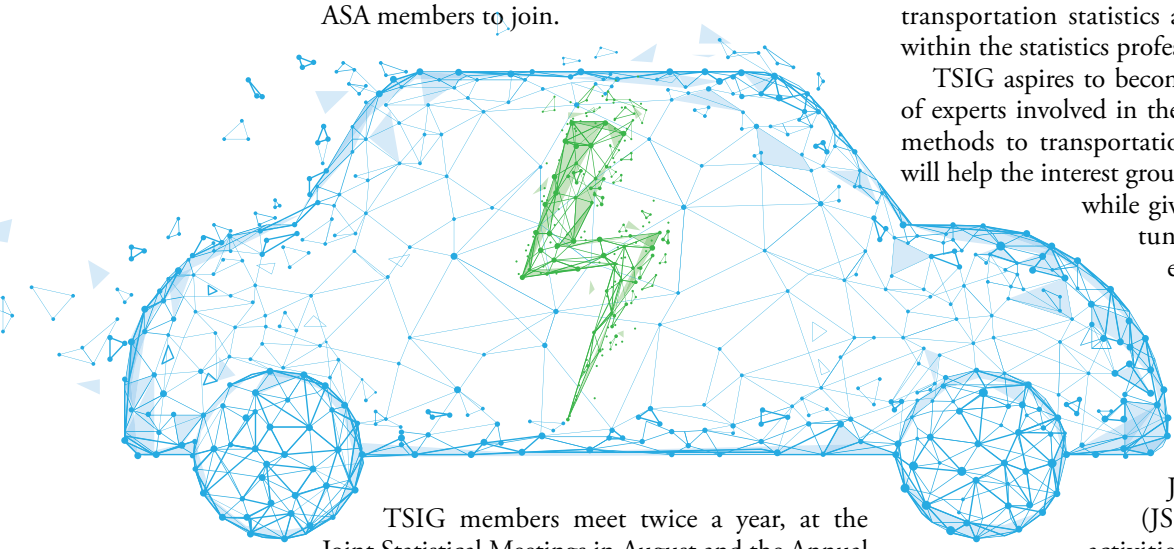
PSSST...STUDENTS!

If you are interested in **improving your programming techniques, making connections, or honing your data analysis skills,** make sure to visit STAT*tr@k* next month. We will be featuring a list of companies looking for interns in 2022.

Transportation Statistics Interest Group Invites New Members

Roya Amjadi, US Department of Transportation, and David Banks, Duke University

Members of the ASA Transportation Statistics Interest Group (TSIG)—made up of statisticians, transportation professionals, engineers, urban planners, economists, and analysts who want to champion the use of statistics in transportation research and application—invite ASA members to join.



TSIG members meet twice a year, at the Joint Statistical Meetings in August and the Annual Meeting of Transportation Research Board in January. They advocate for and research the use of strong statistical methodology for the collection, dissemination, and analysis of transportation data.

Examples of TSIG focus areas include the following:

- Automobile safety
- Autonomous vehicle safety
- Estimation of highway traffic flow
- Text analysis of incident reports
- Demand forecasting
- Fuel economy
- Survey methodology
- Survey analysis

Those who join TSIG will learn about important new data sets and study designs used in transportation research, make contacts with researchers and potential funding sources working in this area, share innovative ideas to improve transportation statistics, and contribute to the growing visibility of transportation statistics as an important subfield within the statistics profession.

TSIG aspires to become a leading organization of experts involved in the application of statistical methods to transportation-related issues. Joining will help the interest group become an ASA section while giving members the opportunity to collaborate with experts in transportation statistics, gain access to data and technical resources, network with future partners and employers, and participate in the Joint Statistical Meetings (JSM). TSIG also organizes activities such as conferences, workshops, and roundtable discussions in cooperation with various ASA sections.

This year, TSIG partnered with several ASA sections to organize workshops and student paper competitions on transportation statistics. TSIG and the Government Statistics Section put together a joint webinar series on topics including highway safety, public health, active transportation, automated vehicles, climate change, and equity impacts of transportation. This webinar series started September 29 and will be held every two months.

TSIG also partnered with the Risk Analysis Section to produce a workshop and student paper competition in October.

More information about the workshops and student paper competitions can be found on the TSIG website at *https://community.amstat.org/tsig/home*.

For details about TSIG or to join, contact Roya Amjadi, TSIG chair, at *roya.amjadi@dot.gov*. ■

Statistical Significance Competition Sees Many Winners

With a record number of 50 submissions to the annual JSM Statistical Significance competition, the ASA Scientific and Public Affairs Advisory Committee (SPAAC) recognized two first-place winners, three second-place winners, and five honorable mentions.

Ji Soo Kim, a postdoctoral student in The Johns Hopkins University Department of Biostatistics, and Lingyun Lyu, a PhD student in the University of Pittsburgh School of Public Health each received $300 for their first-place entries.

Kim's entry focused on how to maximize medical outcomes in personalized medicine by tailoring treatments to the individual characteristics of each patient. Lyu's submission explained how, when addressing chronic diseases that require sequences of treatments, statisticians use data from health records and clinical trials to identify treatment strategies to optimize desired outcomes.

A JSM Statistical Significance entry is a one-page illustration of the value of statistics to society. The objective of the piece is to illustrate to a layperson how the statistical solution to the problem presented in the JSM presentation would help inform decisions that improve society in specific areas such as health, agriculture, economy, education, manufacturing, and medicine.

Started in 2009, the competition is designed to complement the ASA's Statistical Significance documents, a series highlighting the contributions statisticians make to society, from health care and the economy to national security and the environment (*bit.ly/2xtiwIT*).

Figure 1. Thumbnail images of the first-place winning entries (Kim, top; Lyu, bottom)

Statistical Significance Competition Winners

First Place

- Ji Soo Kim, The Johns Hopkins University, "Personalized Risk Estimates in Complex Diseases"
- Lingyun Lyu, University of Pittsburgh, "Multi-Stage Treatment Decisions"

Second Place

- Peng Jin, NYU School of Medicine, "Susceptible Populations and Heterogenous Effects"
- Sneha Rani, North Carolina State University, "Employment Opportunities and COVID-19"
- Seema Sangari, Kennesaw State University, "Statistics and Cyber Risk Quantification"

Honorable Mention

- Adam Elder, University of Washington, "Statistics Improves Vaccine Development"
- Tuo Lin, University of California, San Diego, "Role of Statistics in Survey Interpretations"
- Emily Luetschwager, University of Washington, "Statistics and the Environment: Detecting Natural Gas Leaks"
- Mark Ramos, University of Maryland, Baltimore County, "Statistical Testing Rises to the Challenge of Multiplicity in Genetic Studies"
- Jade Wang, St. Jude Children's Research Hospital, "Statistics to Improve the Treatment of Cancerous Brain Tumors in Children"

View all the posters on the SPAAC website at *community.amstat.org/spaac/awards/poster-award*.

To enter the competition in 2022, learn more at *community.amstat.org/spaac/awards/poster-award*. ■

My ASA Story

Emily Griffith, Associate Research Professor

Emily Griffith is an associate research professor in the North Carolina State University Department of Statistics.

I joined the American Statistical Association because I knew it was what statisticians were supposed to do, but I didn't begin to understand why it's so important until a few years later. My increased involvement has looked a little like this:

1. Attending conferences
2. Speaking at conferences
3. Working with other speakers in between conferences
4. Running and being elected to my local chapter
5. Being a huge fan of the ASA

Before I ran for office in the North Carolina Chapter, I understood some of the value of professional societies as far as providing training and teaching resources, connecting with a professional network, and honoring the work of amazing statisticians. Now that my four years on the executive board of the North Carolina Chapter are ending, I have a much deeper appreciation. We've organized career information fairs, awards dinners, mentoring events, and socials. Through it all, my work with statisticians from all over North Carolina has helped me develop a broader understanding of our field.

However, the most rewarding ASA experience I've had was creating a series of statistical collaboration videos under an ASA-funded strategic initiative with Julia Sharp and Megan Higgs. We worked remotely to write scripts and discussion questions, but all met in Fort Collins, Colorado, to do the filming. The funding allowed us to hire actors and a videographer, and watching our words come to life in the scenes as they were filmed was an amazing experience. We recently released the videos (*bit.ly/3DXfFaz*), and I don't know that I've ever been this proud of something I've worked on professionally.

The roots of these videos go deep into ASA activities. I first met Julia at an ASA-sponsored conference in North Carolina in 2014, and we met again (and started discussing statistical collaboration training more seriously) on a panel at the Joint Statistical Meetings in 2017. She already knew Megan, and the three of us were thrilled to be able to put together the video series thanks to the ASA's funding of our proposal. We announced the videos at our 2020 JSM invited panel discussion and used them to help teach a short course at the Conference on Statistical Practice this year.

Emily Griffith, Megan Higgs, and Julia Sharp take a break from filming the statistical collaboration video series.

> . . . My work with statisticians from all over North Carolina has helped me develop a broader understanding of our field.

These videos were a big shift in my own career—they mark the moment I moved from "only" doing the work to teaching other people how to do the same work. This shift happened because of the American Statistical Association and I'm truly grateful. ■

Sharon Hessney, Educator

In 2011, I was honored to be selected for the Albert Einstein Distinguished Educator Fellowship Program, which allows educators to bring their insights from the classroom to Washington by working in branches of the federal government, including on the Hill.

Sharon Hessney is the writer, moderator, and coordinator for "What's Going On in This Graph?", a weekly feature of the ASA and *New York Times* Learning Network.

> Being a member of the ASA makes me feel like more than 'just a high-school math teacher.'

I was an education legislative aide to Senator Al Franken. When Senate staffers learned I taught math and statistics, they were eager for help on the statistical data they were working with. I said, "I already have a day job, but let me see what I can do."

Ultimately, ASA Director of Science Policy Steve Pierson and I developed "Stat for Staffers," a monthly education program for Senate administrative staff. This was held in conjunction with the Senate Office of Education and Training in a series titled, "Critical Statistical Thinking." ASA member speakers included John Bailer, Miami University; Norean Sharpe, Georgetown University; Bonnie LaFleur, Ventana Medical Systems; Michael Larsen and Mary Foulkes, The George Washington University; Michael Costello, RTI International; Frank Yoon, Mathematica Policy Research; and Jessica Utts, University of California, Irvine.

Stat for Staffers was attended monthly by 40 to 60 people; it was truly rewarding to have made an impact such as this on behalf of the statistics profession.

Extra Tools in Your Toolbox

Being a member of the ASA makes me feel like more than "just a high-school math teacher." I joined the association when I started teaching Advanced Placement Statistics in Boston. I needed all the resources I could find since I was a "sole practitioner," being the only statistics teacher in my school.

Today, I am the curator, writer, and moderator for "What's Going On in This Graph?" This is a free, weekly feature of the *New York Times* Learning Network in partnership with the ASA. It is the only math-oriented feature of the network and has one of the largest followings.

There are so many opportunities available to ASA members. My advice to fellow members is to get active at both the national and local levels of the ASA. I've made many professional friendships that have resulted in helpful statistical assistance and new opportunities.

My advice for students interested in the field? Learn as much about statistics as you can, not just one field of application. Whatever field you go into, it's beneficial to have those extra statistical tools in your toolbox. And, especially since statistics is a relatively young field, never stop seeking what is new. ■

Career Development Committee Hosts Free Professional Networking Event

The ASA's Committee on Career Development (CCD) hosted a free professional development event, "Promoting Your Networking Potential: A Virtual Networking Session," August 5. The event featured statisticians and data scientists from academia, principal federal statistical agencies, and the private sector providing expert perspectives on how to build professional relationships and a network.

Featured statisticians included Xiao-Li Meng, Whipple V.N. Jones Professor of Statistics at Harvard University; Patricia S. Hu, director of the Bureau of Transportation Statistics; and Jeri Mulrow, vice president, statistics and evaluation sciences director, at Westat. More than 250 statisticians from around the world attended the event, which also featured more than 20 volunteer statisticians and data scientists. These volunteers served as mentors to facilitate small-group discussions with students and early-career statisticians in breakout sessions.

"The ASA CCD has hosted this successful event for several years," said ASA CCD Chair Claire Bowen. "It's a fantastic opportunity for statisticians and data scientists at every career stage to interact with colleagues."

During the event, each panelist offered remarks about how to build positive professional relationships during graduate school to help find a job. The discussion continued by addressing how statisticians and data scientists can apply these same relationships to developing effective collaborations to advance one's career. As documented in the ASA's survey of master's graduates (*bit.ly/3bqlp0b*), it is critical for statisticians and data scientists to maintain such professional relationships.

"The panel discussions were excellent, and an important part of the event were the breakout sessions, where statisticians got to socialize in small groups and discuss ideas mentioned in the main sessions," commented ASA Vice Chair Elizabeth Mannshardt.

The ASA CCD is planning to host another free virtual networking event before JSM 2022 and will publicize details in the coming months.

For information about the Committee on Career Development and future offerings, visit *https://community.amstat.org/ccd/home*. ■

Significance Covers COVID-19, Social Media, Rain-Predicting Tortoises

Can a pet tortoise predict when it's about to rain? That's the somewhat unusual question posed by Conner Jackson, winner of *Significance* magazine's Statistical Excellence Award for Early Career Writing. Jackson's article, "Pietro the Weather Tortoise and the Pursuit of Soggy Bun Prevention," leads the line-up of feature articles in the October 2021 issue of *Significance*.

In the same issue, there's a focus on cybersecurity and how text analysis can be used to spot "phishing" attempts. And Part 3 of the magazine's "History of the Data Economy" appears, with this latest installment telling the story of how social media sites became data economies in their own right.

There's also an interview focusing on the UK statistical system's response to COVID-19 and how it is preparing for what comes next, a discussion about data science standards, and an update to the story of "the lady tasting tea."

Plus, have you ever wondered who was the best friend on the TV show Friends? Matthias Basner has, and he presents a quantitative analysis that attempts to answer that question.

Also in the October issue:

- Statistical inference allows researchers to learn about a population using only a sample of data from that population. But if it isn't a random sample, inference becomes tricky or outright impossible, as Norbert Hirschauer, Sven Grüner, Oliver Mußhoff, Claudia Becker, and Antje Jantsch explain.
- Rob Gandy examines the contradictory adjectives used by the media to describe the same numbers in different contexts.
- Leighton Vaughan Williams introduces readers to "The Doomsday Argument."

Access the digital version of *Significance* through ASA or RSS member portals (*www.significancemagazine.com/654*) or download and read the magazine on the go with our iOS and Android apps (*bit.ly/2BdoGh3*). Print issues will be mailed to subscribers soon.

Significance is online at *www.significancemagazine.com*.

COPSS Honors 13 with Awards

Huixia Judy Wang, COPSS Treasurer/Secretary

The Committee of Presidents of Statistical Societies (COPSS) presents awards annually to honor statisticians who have made outstanding contributions to the profession. For 2021, COPSS awards were presented at the Joint Statistical Meetings (JSM) on August 11 by COPSS Chair Bhramar Mukherjee and the award committee members.

Jeffrey T. Leek of The Johns Hopkins University is the winner of the 2021 Presidents' Award. This award is presented annually to a young member of one of the COPSS participating societies in recognition of outstanding contributions to the profession. The award citation recognized Leek for "influential work addressing high-dimensional data; for development of empirical tools for data science as a science with applications to meta-research, reproducibility, and replicability; for scaling (bio)statistics-centered data science education to millions of people worldwide; and for leveraging data science tools, educational technologies, and community partnerships to create economic opportunities in under-served communities."

Alicia Carriquiry of Iowa State University is the recipient of the 2021 F.N. David Award and Lectureship. This award, sponsored jointly by COPSS and the Caucus for Women in Statistics, is granted biennially to a female statistician who serves as a role model to other women by her contributions to the profession through excellence in research, the leadership of multidisciplinary collaborative groups, statistics education, or service to the professional societies. The award citation recognized Carriquiry for "being an outstanding role model for female and Latin American statisticians and for statisticians striving for scientific impact; for influential Bayesian, forensics, transportation, and nutrition research; for effective leadership of multidisciplinary groups; for extensive engagement in the National Academies and professional statistical societies; and for advocacy for female and early-career statisticians." Carriquiry's lecture was titled "Statistics in the Pursuit of Justice: A More Principled Strategy to Analyze Forensic Evidence."

Wing Hung Wong of Stanford University is the recipient of the 2021 COPSS Distinguished Achievement Award and Lectureship. This award recognizes outstanding scholarship in statistical sciences that has had a highly significant impact of statistical methods on scientific investigations. The award citation recognized Wong for "groundbreaking and fundamental contributions to statistical theory and applications, particularly in likelihood inference, Monte Carlo computation, Bayesian statistics, and computational biology." Wong's lecture was titled "Understanding Human Trait Variation from the Gene Regulatory Systems Perspective."

David Dunson of Duke University is the honoree for the 2021 George W. Snedecor Award. This award, established in 1976 and given biennially, honors an individual who has been instrumental in the development of statistical theory in biometry. The award citation recognized Dunson for "seminal and consequential advancements in the theoretical and methodological underpinnings of Bayesian modeling and inference and for significant contributions in high-dimensional statistical inference, nonparametric Bayesian modeling, and their wide-ranging applications in biomedical and natural science."

MORE ONLINE
Visit *https://community.amstat.org/copss/home* for details about eligibility and nomination requirements for all these awards. The deadline to nominate a candidate for 2022 is December 15.

Emma Benn
Mount Sinai

Claire McKay Bowen
Urban Institute

Tamara Broderick
MIT

Jeff Goldsmith
Columbia University

Stephanie Hicks
Johns Hopkins

Jonas Peters
University of Copenhagen

Aaditya Ramdas
Carnegie Mellon University

Alisa Stephens-Shields
University of Pennsylvania

Lingzhou Xue
Penn State

The COPSS Leadership Academy is a new initiative for emerging leaders in statistics. This award recognizes the increasingly important role early-career statistical scientists are playing in shaping the future of the discipline and is designed to call attention to the efforts of these individuals and to provide a mechanism for them to share their vision for the field with each other and the statistical community. Nine awardees to the 2021–2024 COPSS Leadership Academy were recognized at JSM. ■

Jeffrey T. Leek Wins COPSS Presidents' Award

Jeffrey T. Leek is a professor of biostatistics and oncology at the Johns Hopkins Bloomberg School of Public Health and co-director of the Johns Hopkins Data Science Lab. He has a bachelor's degree in mathematics from Utah State University and an MS and PhD in biostatistics from the University of Washington. His group develops statistical methods, software, data resources, and data analyses that help people make sense of massive-scale genomic and biomedical data. As the co-director of the Johns Hopkins Data Science Lab, he has helped develop massive online open programs that have enrolled more than 8 million individuals and partnered with community-based nonprofits to use data science education for economic and public health development.

The COPSS Presidents' Award citation recognized Leek for influential work addressing high-dimensional data; for development of empirical tools for data science as a science with applications to meta-research, reproducibility, and replicability; for scaling (bio) statistics-centered data science education to millions of people worldwide; and for leveraging data science tools, educational technologies, and community partnerships to create economic opportunities in underserved communities.

What was your first reaction to winning the prestigious COPSS Presidents' Award?

I was stunned and delighted to find out I had won the COPSS Presidents' Award. I've been such an admirer of many of the past winners, and it feels a little surreal to be selected. I'm incredibly grateful to my students, postdocs, collaborators, colleagues, and mentors who have made this possible and I'm just really excited to be able to share the news with them.

Which part of your job do you like most?

My absolute favorite part of my job is the brainstorming phase of any new project, especially with a group of people with different backgrounds, experience, and ideas. The combination of learning and excitement that happens during that part of a project is the best. I've been very lucky to work with smart, fun, and nice people—it's a combination that makes it easy to want to take on new challenges.

What advice would you give to young people who are entering the profession as PhD students and assistant professors at this time?

I always feel a bit uncomfortable giving advice; it's usually worth what you pay for it :). I will say that [the following] three pieces of advice I received from mentors have served me really well:

1. Find people you like to work with and prioritize who you are working with as much as what you are working on
2. Work on things you care about, even if it isn't typical or what you think others expect
3. Try to find places to work where the funding aligns with what you like or want to do

I'm really impressed and excited by the things I see junior faculty, postdocs, and students doing on Twitter, and I'm particularly impressed at the wide variety of different ways you can define "being a statistician." The big tent model of statistics is awesome.

Who are your most significant mentors? How did/do they impact your career?

I have had many amazing mentors throughout my career! Jim Powell at Utah State University gave me my first undergraduate research experience, took me to my first conference, and encouraged my love of research.

John Storey, my PhD adviser, was an amazing mentor. I was

Jeffrey T. Leek

one of his early students and really benefited from a ton of close interaction and support. He introduced me to genomics, spent tons of time helping me learn to write, taught me a framework for thinking about problems I still use, and introduced me to his collaborators and network. I really wouldn't have been able to do any of this without his early support.

Giovanni Parmigiani got me a job near my wife, introduced me to the Hopkins crowd, and broadened my thinking about biostatistics beyond genomics.

Finally, Rafa Irizarry, my first faculty mentor, basically showed me all the ropes as I was getting started, helped me get connected to the broader biostatistics community, and has been a sounding board and friend for years.

There are a bunch more, as well. I feel like anyone who has had the good fortune to end up in a successful place relies on a whole community of mentors, friends, and colleagues to make it possible.

Why were you drawn to biostatistics and data science?

Like many graduate students in (bio)statistics, when I started my career, I thought, "I like math and I want to find a way to help people." I love that statistics lets me work on problems I feel are meaningful for helping people.

Anything else you would like to share about our profession?

That one of the best parts of statistics is the community. I really have loved being part of the statistical community; it's very broad and has all sorts of fun niches to find a group of people you can work with. For me, that happened on social media, through Twitter. Chris Volinsky got me on there at JSM 11 years ago and it has helped me connect to so many incredible people around the world who care about statistics like I do. Whether it's through social media, ASA committees, networking events, or conferences, I would definitely say that one of the best parts of being a statistician is all the fun people to work with.

Finally, what are your hobbies/interests beyond statistics?

I love to run, hike, and (when I have the time) cook and pickle peppers :). I have two highly energetic sons and also get super excited to take them out mountain biking and swimming and coach their sports teams. I also have been learning from them and am improving my Minecraft Dungeons level! ■

MORE ONLINE
You can follow Leek on Twitter—@jtleek.

THE JEDI CORNER

Statistics for Equity: Capturing, Not Masking, Intersectional Dynamics in Data

Stephanie H. Cook, Suzanne Thornton, Samantha E. Robinson, James Cochran, and Godwin Yung

The JEDI Corner is a regular component of Amstat News *in which statisticians write about and educate our community about JEDI-related matters. If you have an idea or article for the column, email JEDI Outreach Group member Cathy Furlong at* communicate@datascijedi.org.

Statistics is the language of data. Just like any other language, statistics requires structure and rules for interpreting messages from data. However, statistics poses additional communications challenges, as it depends on one's written language, which is always rife with nuances. Hence, the effectiveness of statistics for communicating concepts from data (e.g., selecting, understanding, and interpreting statistical models) also depends on one's written language acuity.

Another concept that continues to present communication challenges in the world of statistics is intersectionality, which refers to the overlapping nature of multiple oppressions based on one's identity (e.g., gender, race/ethnicity, sexual orientation, age). Conceptions of intersectionality posit that intersecting identities and processes (e.g., systems of sexism such as laws that limit the individual's ability to make decisions about their bodies) are both vitally important to understanding inequity, according to Greta Bauer and Ayden Scheim in "Advancing Quantitative Intersectionality Research Methods: Intracategorical and Intercategorical Approaches to Shared and Differential Constructs," published in *Social Science & Medicine.*

To properly measure and analyze concepts related to intersectionality, the educated statistician must understand the benefits and limitations of historical and current approaches while contributing to the development and use of validated new statistical methodologies that can more accurately capture the embedded, multi-level nature of intersectionality.

Early approaches to measuring intersectionality, mostly in sociological and health-related research, used the additive approach, which combines social categories (e.g., gender and race) by adding new terms to statistical models. This early approach signaled a statistical appreciation for the need to measure and assess diverse features of the human experience.

The additive approach inherently assumes that occupying multiple social statutes at once (e.g., being both a female and a sexual minority) "add" to increase poor health, for instance. This is in direct contrast to social theorists who posit that intersectionality is multi-level and positional and, decidedly, not additive.

For instance, Kimberlé Crenshaw, in her 1990 *Stanford Law Review* article, "Mapping the Margins: Intersectionality, Identity Politics, and Violence Against Women of Color," cites the example of a Black woman who was unable to successfully defend her case on employer discrimination based on her identity as both a Black American and a woman because the legal protections in her favor treated discrimination based on race and gender in separate manners; that is, the effect of being a Black American differs by gender. From this perspective, additive experiences do not adequately speak to the positionality of one who occupies multiple social statuses.

Of course, there are exceptions and cases in which statisticians are examining the accumulation of an experience on an outcome (e.g., the additive effect of racial and sexual orientation–based discrimination). But when statisticians are specifically attempting to measure, model, and understand intersectional social processes themselves, they must appreciate that an additive approach is not appropriate.

Today, many statisticians—and researchers more broadly—use the multiplicative approach to understand intersectionality. In this approach, interaction terms between different groups (e.g., Black and woman) are used to understand the differences in an outcome compared to another group (e.g., white and male). However, scholars such as Clare Evans, who wrote the *Social Science & Medicine* article titled, "A Multilevel Approach to Modeling Health Inequalities at the Intersection of Multiple Social Identities," as well as Bauer and Scheim have pointed out the theoretical and empirical limitations of such a method.

First, this method does not allow us to statistically account for the intrinsic intersections of social disadvantages and privileges that may interact within a given group. For instance, white females may experience some measurable privilege based on their whiteness while also experiencing disadvantage due to being female. In another example, a gay and white man may experience sexual orientation discrimination based on his sexual minority status, but also have privileges afforded to him for being white and a male. The widely used multiplicative statistical approach to evaluating intersectionality cannot capture these nuanced, but critical, aspects of the effect of intersectionality on an outcome.

Second, this approach can suffer from small sample size bias, interpretability problems, and model fit issues.

Current approaches to measuring and modeling intersectionality in statistical analyses are promising but, unfortunately, underused. One of the more widely used methods of modeling

the complex nature of intersectionality is multi-level modeling. Scholars such as Tom Snijders, Roel J. Bosker, Hae Yeon Choo, and Myra Ferree have used multilevel modeling to examine how social structures interact with individual identities to produce inequities. This powerful tool gives us the ability to describe variability both within particular social processes and between intersecting social processes.

In one example, Evans and colleagues employed a multilevel modeling approach to understand the intersections of gender, race/ethnicity, income, education, and age. The authors were able to identify 384 intersecting interactions and compare these to the main effect of each variable on body mass income using the National Epidemiologic Survey on Alcohol and Related Conditions. Through this inquiry, the authors were able to explore the interactions of intersections between and within categories of gender, race/ethnicity, income, education, and age. In other words, multi-level approaches allow us to explore the variance between and within intersectional categories rather than treating intersectionality as a fixed effect.

Though multilevel modeling holds much promise in the study of intersectionality research, it has drawbacks. One significant drawback is the reliance on large sample sizes and a small number of categories (and levels within the categories). Hence, to understand the complex nature of intersectionality, statisticians must use validated existing approaches while continuing to develop new approaches that address some of the known limitations.

Another drawback is that, despite the existence of these multilevel modeling techniques, many researchers continue to rely on techniques they are more familiar with (e.g., the multiplicative or additive approaches), which ultimately limits our ability to understand the ways in which multiple intersecting statuses and processes overlap to produce varying degrees of inequity.

This overview of statistical approaches to study intersectionality is by no means exhaustive. There are related modeling approaches that support the study of intersectional processes at multiple levels, including moderated mediation and latent class analysis.

It is clear, however, that the statistics field already plays an important role in communicating intricate concepts such as Intersectionality. Effective communication begins with education. Students, academics, and professionals in the inherently collaborative discipline of statistics must understand the meaning of intersectionality before we can appropriately measure and analyze it. Such knowledge is what enables a statistician to understand the difference between measuring multiple statuses and social processes (e.g., additive models) and intersecting statuses and social processes (e.g., multiplicative models).

Once educated on intersectionality, the statistician must become familiar with different approaches for measuring and modeling intersectionality. Tutorials, workshops, and presentations within both academic and other professional settings will help the statistician inform practitioners about the many tools available. Professional organizations such as the ASA's Justice, Equity, Diversity, and Inclusion (JEDI) Outreach Group provide a space for this dialog by focusing explicitly on intersecting identities and systems in relation to our discipline.

Statistics can help make the invisible, visible. But we first must remove any and all stigmas associated with discussing power, privilege, and marginalization in statistical inquiry. These stigmatizations limit our ability to communicate about intersectional identities and social processes with one another and the broader scientific community, especially in relation to methods pertaining to intersectional identities and social processes. Once conversations around equity and inclusion, for instance, become endemic, it will become easier to have open and direct dialogs about intersectionality. Advances in education and research from a statistical point of view can contribute to a larger discussion on intersectionality for the ultimate goal of improving equity.

Further Reading

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2020 Master's Graduates Land on Feet Despite COVID-19

Steve Pierson, Director of Science Policy

The class of 2020 graduated into uncertain times and a job market deeply affected by the COVID-19 pandemic. Nevertheless, the statistics and biostatistics master's graduates in the job market who responded to the ASA follow-up survey seem to have landed on their feet, reporting similar employment figures as the class of 2018 cohort reported (*https://magazine.amstat.org/blog/2019/08/01/mastergraduate*).

Figure 1. Words used to describe the job search during the COVID-19 pandemic

With the limitation that neither the survey results reported here nor for the previous cohort are fully representative of the several thousand graduates for each, the respondents have a similar unemployment rate—less than four percent—and the salaries are generally higher than two years prior. Similarly, job satisfaction rates remain high.

The survey did not ask pandemic-specific questions; however, many respondents referred to the stress, duration, and difficulty of their job search due to hiring freezes and limited options during the pandemic. Figure 1 is an arrangement of the words used by those respondents.

The survey results provide insight into the work statistics, biostatistics, and data science graduates are doing—including the variation thereof—and the types of jobs they are obtaining.

Besides yielding insights into the job market for master's graduates in statistics and related fields, the survey results are helpful to those reviewing the free responses of the survey participants who shared their experiences, reflections, and advice.

Survey Respondent Overview

Four hundred three individuals responded to the survey and indicated having earned a master's degree in statistics, biostatistics, or a related field during the 2019–2020 academic year. Not all completed the entire survey. Of the 304 responding to the gender question, 51 percent identified as female, 48 percent as male, 1 percent as other, and 1 percent as preferring not to say. The median age of the respondents at the time of master's receipt was 26, and the mean age was 27.

For the 301 students providing citizenship status, 65 percent are US citizens and 3 percent are permanent residents (green card holders). Eleven percent had the Optional Practical Training (OPT) visa, 3 percent had an H1-B visa, and 16 percent had another temporary visa. For respondents who are not US citizens, 64 are from China, nine from India, four from Canada, three each from South Korea and Taiwan, and the remaining 12 from 11 other countries. Respondents were not asked for race or ethnicity information.

The respondent demographics of this survey can be compared with the overall master's graduates in statistics and biostatistics reported by the National Center for Education Statistics (NCES) for the most recent year for which data is available (2020). There were approximately 4,000 statistics and 900 biostatistics master's graduates in the US in 2020. Of these, 47 percent of statistics master's recipients are female, 61 percent for biostatistics. US citizens and permanent residents are overrepresented in this survey's respondents as they have only accounted for 42 percent of the overall master's degrees in recent years.

Based on the number of respondents providing the specific field of their master's degree, there are almost as many biostatistics master's graduates represented in these survey results as the other categories combined.

Documenting the wide draw of statistics and biostatistics master's programs, 360 respondents reported 58 bachelor's degree fields. The most common were mathematics- and statistics-related degrees, as listed first in Table 1. Nearly 43 percent of the respondents had an undergraduate degree in a field other than mathematics and statistics, the most common being biology and economics, also shown in Table 1.

Master's graduates from nearly 80 departments participated in the survey: Columbia University biostatistics (24); North Carolina State University (21); University of Michigan biostatistics (15); Carnegie Mellon University (13); University of Kansas Medical Center biostatistics (13); University of California, Los Angeles biostatistics (12); University of Michigan (11); University of Minnesota, Twin Cities (10); Duke University biostatistics (9); and Georgetown University biostatistics (9).

The respondents generally fall into two categories. Of the 403 who provided their employment and enrollment status as of March 1, 2021, 235 reported themselves as employed—228 full time—and nearly a third as a student, as shown in Table 2. Fifteen of these respondents (3.7 percent) reported themselves as unemployed and seeking. The corresponding unemployment rate for the 420 class of 2018 graduates was 3.6 percent.

Employed

For the 155 full-time employees who reported their annual salary, the median was $75,000. While this amount is $2,000 less than the corresponding number for the 2018 master's cohort, the decrease is likely an artifact of the overrepresentation of biostatistics master's graduates. For the 16 individuals reporting hourly pay, the median was $32/hour, with the middle half being in the range of $22.50/hour – $34.50/hour. As shown in Table 3, the median salary for females with a statistics master's was lower than for the corresponding males. The lower overall median salary for females is largely explained by breaking down salaries by degree field and employment sector.

Comparing the respondents from the classes of 2018 and 2020 by master's degree field, median salary for the more recent graduates is higher for general statistics and biostatistics, the same for applied statistics, and lower for data science. This is shown in Table 4, where N is the total number of respondents from the class of 2020 who reported both full-time employment and employment sector; "n" is the subset of respondents who reported salary. For the 2020 cohort, the number of females reporting annual salary is shown in parentheses. Those whose specific degree field is biostatistics are 44 percent of those providing salary for the 2020 class, versus 39 percent for the class of 2018. Therefore, the median salary for biostatistics master's degree field being the smallest of the four main areas in this year's survey partially explains the decline in the overall median salary noted above. Similarly, the lower median salaries for females overall could partially be explained by the fact that 62 percent of the 69 respondents reporting biostatistics as their master's degree field

Table 1—Bachelor's Degree Field

Undergraduate Major	N
Mathematics	73
General Statistics	69
Math, w Stats emphasis	26
Applied Statistics	17
Actuarial Science	8
Biostatistics	5
Data Science	4
Informatics	2
Biology	32
Economics	22
Other	11
Biochemistry/Chemistry	9
Psychology	9
Computer Science	6
Physics	5
Environmental Science	5
Engineering, Env/Geophy/Industrial	5

Table 2—Employment/Student Status

Undergraduate Major	N	Percent
Full-Time Employed	235	58.8%
Student	127	31.8%
Unemployed Seeking	15	3.8%
Left US	13	3.3%
Other	10	2.5%

Table 3—Median and Quartile Salary by Gender

	N	Quartile 1	Median ($)	Quartile 3
	155	65,000	75,000	95,500
Female	81	65,000	73,000	88,000
Male	71	68,500	80,000	100,000

Table 4—Specific Field of Master's Degree and Median Salary for n>4

Master's Degree Field	N - 2020	Salary - 2018		Salary - 2020	
		n	Median ($)	n (female)	Median ($)
General Statistics	91	38	70,000	43 (15)	80,000
Applied Statistics	56	55	80,000	33 (18)	80,000
Actuarial Science	1				
Data Science	16	5	113,000	9 (4)	100,000
Informatics	1				
Biostatistics	140	63	70,000	69 (43)	72,000
Math, with stats focus	4				
Other	2				

Table 5—Employment Sector with Median Salary by Gender for n>4

Sector	N	n (Female)	Overall	Female	Male
Two-year college	1				
Four-year college or university	5				
University affiliated research institute	40	30 (20)	64,000	65,500	62,500
Other private sector	25	21 (11)	80,000	80,000	78,500
Finance or banking	12	9 (5)	90,000		
Government contractor	7	6 (3)	80,500		
Insurance	14	14 (3)	82,600		
Pharmaceutical	20	17 (10)	83,000	78,500	90,000
Technology	26	23 (8)	100,000	106,000	100,000
Government lab	2				
Federal statistical agency	2				
Hospital or medical facility	15	14 (8)	70,650	75,150	66,500
Nonprofit organization	5	5 (4)	70,000		
Other sector	1				
Other federal agency	3				
State or local government	7	5 (1)	77,796		

(and providing their salary) are women.

The fraction of women in each employment sector also partially explains the differences in median salary by gender. Table 5 shows the total number, N, of respondents who reported sector and the subset, n, who also provided salary (for n>4). The number in parentheses in Column 3 is the number of women. The employment sectors in which women tend make up the majority of respondents providing salary (e.g., university-affiliated research laboratory and nonprofit organization) tended to have the smaller median salary. Conversely, only 35 percent of respondents are women for the technology sector, which has the largest median salary. Breaking down the median salary by sector, it is larger for the female respondents in three of the four sectors for which there are at least five female and five male respondents. The "other private sector" fill-in responses varied, with some form of consulting being roughly a third.

Median salaries varied substantially by state, as show in Table 6, likely explained in part by the employment sector predominant in that state.

The overall median salary of $75,000 compares well with salaries projected for the broad categories of engineering, computer science, business, and math and sciences by the National Association of Colleges and Employers (NACE). See Table 7 showing the 2020 and 2021 NACE projections.

As was the case previously for both this survey and the ASA statistics bachelor's survey, numerous and diverse companies hired master's graduates into positions with a wide assortment of job titles. For the 172 employed respondents who provided the name of their employer, there were 161 unique names. Similarly, there were more than 109 unique—although similar—job titles. The most common were data scientist (20), biostatistician (18), data analyst (9), biostatistician I (7), and statistician (5).

Respondents were also asked the number of job offers they had at the time they accepted their position. The distribution was similar to the class of 2018 cohort, with 4.3 percent of the 185 respondents not receiving an offer (4.8 percent for class of 2018), 51 percent receiving one offer (49 percent for class of 2018), 30 percent receiving two offers (27 percent for class of 2018), 10 percent receiving three offers (13 percent for class of 2018), and 4.9 percent receiving four or more offers (3.9 percent for class of 2018).

For how influential graduates felt their statistics-

Table 6—Median Salary by State for n>4

State	n	Median ($)
California	15	100,000
Georgia	5	62,000
Illinois	8	70,000
Kansas	5	88,000
Maryland	5	72,000
Massachusetts	10	82,000
Minnesota	7	80,000
New Jersey	5	98,750
New York	16	75,250
North Carolina	9	70,000
Oregon	6	87,898
Pennsylvania	7	80,000
Washington	5	120,000

Table 7—National Association of Colleges and Employers Salary Projections by Broad Category for Classes of 2020 and 2021 Master's Graduates

Broad Category	2021 Salary Projection	2020 Salary Projection
Computer sciences	$85,373	$79,793
Engineering	$80,320	$77,298
Business	$75,461	$75,197
Math and sciences	$73,992	$79,717

related master's degree was in securing their current position, 95 percent of respondents responded influential, with 77 percent reporting very influential. Eighty-four percent reported being satisfied with their position (52 percent very satisfied), 81 percent with salary and benefits (41 percent very satisfied), 90 percent with job security (59 percent very satisfied), 81 percent with opportunity for advancement (42 percent very satisfied), 77 percent with intellectual challenge (47 percent very satisfied), and 89 percent with level of responsibility (46 percent very satisfied).

Three general themes came up often in the descriptions of job search experiences and how respondents located and secured their positions. The most common was the role of online postings and websites such as LinkedIn and Indeed in helping land a job. The importance of both internships and personal and professional social networks was also noted frequently in helping to secure a position. Other strong themes that came through were persistence, flexibility, and spreading of a wide net. The following are a sampling of the responses:

- "Found through previous internship"
- "LinkedIn, referrals, job fairs, Handshake"
- "Difficult during a pandemic. Lots of online searching and lots of applications."
- "Used university job portal and connections to MS program"

The survey sought to understand the nature of the work undertaken by master's graduates. Sixty-two percent reported solving technical problems on a daily basis, and 65 percent reported working on a team as often, as shown in Table 8. At least 40 percent of respondents reported engaging in database management, quality control, and project management on a daily basis. The next most common were technical writing, nontechnical writing, and working with clients.

The most frequently used technical skills were analyzing/interpreting data (74 percent daily) and programming or systems software (65 percent), as shown in Table 9. More than half the respondents did database querying on a daily basis. The next

Survey Administration

The American Statistical Association contracted the Statistical Research Center of the American Institute of Physics (AIP) for the survey of both bachelor's and master's graduates in statistics and biostatistics in 2020. The ASA provided department names and contacts for the departments granting statistics or biostatistics degrees according to our records. For both the bachelor's and master's graduates, AIP reached out to 232 departments, receiving the names and contact information for 1,921 master's graduates who received up to four invitations to participate in the survey. Departments that did not provide contact information for graduates were asked to distribute survey invitations to their alumni. The survey of 2020 graduates followed closely that of the class of 2018.

The ASA will conduct this survey again in two to three years. Send your suggestions for how to improve it and topics to cover or omit to Steve Pierson at *pierson@amstat.org*.

Table 8—Frequency of General Work Skills

Question	Rarely or Never	Monthly	Weekly	Daily	Total
Work on a team	2.70%	5.50%	27%	65%	182
Teaching	65%	19%	12%	4.60%	175
Public speaking	37%	29%	26%	8.00%	176
Work with customers or clients	39%	18%	23%	21%	177
Manage people	72%	8.60%	8.60%	10%	174
Manage projects	23%	11%	19%	46%	175
Manage finances or budgets	86%	5.70%	4.60%	4.00%	174
Manage database	27%	19%	19%	35%	177
Perform quality control	22%	19%	23%	37%	178
Solve technical problems	7.90%	11%	19%	62%	178
Technical writing	22%	37%	25%	16%	177
Non-technical writing	26%	26%	25%	23%	176

most often–used skills, done at least weekly by 60 percent of the respondents, were using statistics or advanced math and statistical model use or development. Looking at daily use of technical skills by master's discipline, as shown in Table 10, there is little variation for applied statistics, biostatistics, and general statistics.

The top software programs in terms of daily use were R (42 percent), SQL (33 percent), SAS (32 percent), and Python (25 percent), as shown in Table 11. In contrast, the software programs reported to be least used in their positions were Minitab (1 percent), Java (5 percent), JMP (4 percent), and SPSS (4 percent). Excel was mistakenly omitted from this year's survey but was highly used for the class of 2018 respondents. Daily use of the top four software programs varies—sometimes widely—by master's discipline (see Table 12). The daily use of Python, for example, varied from 5 percent for those with a master's in biostatistics to 90 percent for the approximately 10 data science master's respondents.

Students

For the graduates who were enrolled in a full-time degree program, 89 were in a doctorate program, 10 in a master's, and five in other programs. Twenty-nine of these were in a statistics program, 48 in biostatistics, and six in data science. Of the 23 other fields of study, the following programs each had two or more respondents enrolled: economics (4); mathematics (3); biology (2); health (2); computer science (2); psychology (2); and education (2). Forty-four of the students in a biostatistics doctoral program also earned their master's in biostatistics, 19 for statistics.

Reports on Master's Studies and Job Search Experiences

Respondents were generally satisfied with their master's degree training. Eighty-nine percent of respondents reported they agreed their master's program prepared them to effectively analyze and interpret data critically using statistical models, with 44 percent strongly agreeing. Eighty-two percent agreed their master's program prepared them to effectively analyze and interpret data critically using computational methods, with 37 percent strongly agreeing. Seventy-nine percent agreed their program prepared them to effectively communicate—both orally and in written form—results of statistical analyses to a variety of audiences, with 34 percent strongly agreeing.

Respondents were asked to comment about what they might do differently when looking back at their master's education. The responses were varied, covering such topics as taking better advantage of the available resources and educational opportunities to learning more coding, computer programming, and statistical/database software to seeking more experience within their industry of choice and real-world applications of their degree program. Here are four of the more than 100 responses:

- "I would have learned more programming, sooner. My stats degree was great! But it's a starting point, doesn't provide all I need. We did learn some programming but it's just a skill I need much more of."
- "More chances to develop and grow professional connections. For myself, I don't have people in my daily life that can connect me to someone in the field. It still feels very much like it's who you know."

- "More focus on soft skills and real world analysis."
- "Build stronger relationships with a variety of faculty members and students to grow my professional network."

All the responses can be found in the supplemental materials at *https://magazine.amstat.org*.

Graduates were also asked what types of experiences, training, or other qualifications they feel would have helped them secure a position. Among the roughly 10 respondents, several mentioned learning programming languages such as SQL and Python, and three mentioned internships. Here are a few of the responses:

- "Experience in Python and SQL. More than one year working experience in related roles."
- "More programming experience and more experience in internships doing applied work"
- "Big data platform experience (AWS, GCP), more project based learning, more software development overlap."

For their job search, 67 percent said their statistics department or faculty provided career guidance, and 37 percent said they used the campus career counseling center. Sixty-six percent of the latter found their engagement with the career counseling center useful. The free responses to why or why not the center was helpful varied. Several commented that the interview coaching was helpful, while others appreciated the help with résumés or identifying positions for which to apply. A few commented that their center didn't seem equipped to help identify jobs with their expertise or interests. Select responses include the following:

- "Helpful perspective and sanity check. Made me feel like I wasn't alone with the search and they were on my side."
- "I frequently went to career counseling center before I graduated. The staffs there were very helpful in helping me put together a professionally looking résumé and giving me practical advice for salary negotiation."
- "I used the career center weekly around the time I was interviewing for jobs. They helped me feel much more comfortable with interviewing."

Table 9—Frequency or Research and Statistical Skills

Question	Rarely or Never	Monthly	Weekly	Daily	Total
Use statistics or advanced math	7.70%	21%	25%	46%	182
Analyze and interpret data	2.20%	7.70%	17%	74%	186
Query databases	11%	16%	18%	56%	180
Use or develop statistical models	17%	22%	21%	41%	179
Design experiments	57%	25%	9.60%	9.00%	177
Survey research	64%	15%	11%	11%	178
Programming or systems software	15%	7.40%	13%	65%	176
Tech support or computer administration	68%	14%	8.50%	9.60%	177
Manage database	27%	19%	19%	35%	177

Table 10—Percentage of Respondents Using Select Technical Skills Daily by Master's Discipline

	Applied Statistics (38)	Biostatistics (80)	General Statistics (48)	Data Science (11)
Analyze and interpret data	69%	70%	81%	91%
Use or develop statistical models	32%	40%	46%	64%
Programming or systems software	63%	71%	55%	82%
Query databases	55%	53%	57%	73%
Use statistics or advanced math	38%	46%	48%	73%

Table 11—Frequency of Statistical Programs/Software Use

Question	Rarely or Never	Monthly	Weekly	Daily	Total
R	18%	23%	17%	42%	175
SAS	52%	7.6%	8.2%	32%	170
JMP	96%	1.9%	0.0%	1.9%	161
Minitab	99%	0.0%	0.0%	1.2%	190
SPSS	96%	1.9%	1.9%	0.6%	162
Python	51%	17%	7.1%	25%	169
Java	95%	3.1%	0.6%	1.2%	163
SQL	39%	13%	15%	33%	173
Tableau	74%	17%	4.9%	4.3%	192
Other:	50%	15%	14%	21%	52

Table 12—Percentage of Respondents Using Programs/ Software Packages Daily by Master's Discipline

	Applied Statistics (36)	Biostatistics (80)	General Statistics (47)	Data Science (10)
R	31%	51%	40%	22%
SAS	17%	53%	14%	0%
SQL	39%	20%	46%	56%
Python	41%	5%	31%	89%

MORE ONLINE
Read the report for the 2020 bachelor's graduate survey at *magazine.amstat.org/blog/2021/10/01/bachelors-degree-statistics.*

- "They helped me restructure my résumé and advised me on keywords to help me find the right job."
- "They don't have experience with placing individuals with advanced degrees in STEM fields. They don't know what opportunities are out there, or what job networks to direct students towards."

Finally, respondents were asked for additional comments or advice for current statistics students. The responses generally focused on actively taking advantages of the breadth of opportunities to gain knowledge, experience, skills, connections, and perspective, as exemplified in the following responses:

- "Build strong foundations on statistics and probability before jumping into machine learning and modeling. Learn to see the bigger picture and not just focus on modeling. Modeling is a small part of a Data Scientist's job. The larger part of the job is understanding and the problem and communicating effectively the solutions as actionable insights."
- "Utilize as much materials and resources at your disposal. As a foreigner, don't be shy to approach for help. Try to get as much hands-on experience, such as research work. Network."
- "It's hard to break into the data science field if you are not competent in Python."
- "Get comfortable communicating about statistical insights, it's no use if you can't tell other people about what you discover."
- "Having a strong math/stats background pays off immediately. It allows you to think critically and generalizes well to other problems. My advice for graduating students for immediate success is to work on programming (R, Python, and SQL) and business skills."
- "Make sure that learning doesn't end with coursework or the primary objectives of your research. Specifically, continually try to improve your coding skills, ability to work with new software, understanding of new study designs and statistical methods, writing skills, presentation skills, management skills, having difficult conversations in the workplace, etc."
- "Please make use of the American Statistical Association's mentoring services. I was a recipient of an ASA award and Diversity Workshop Mentoring Program graduate in my MS tenure and it made all the difference in helping me figure out where I wanted to go with my degree."
- "Get a job or internship in analytics. If you can't, build a nice portfolio of analytics projects with a variety of problems and technologies to showcase capabilities. Having a degree is not sufficient." ■

STAT*tr@k*

How to Navigate Data Science Career Opportunities Like a Pro

So, you've decided to pursue a career in data science—smart choice! Statistics and data science are some of the fastest-growing and most in-demand careers. With so much data touching practically any topic, statisticians and data scientists are more sought after than ever before.

But if you're struggling to understand what all those different positions and paths really are, you're not alone. Navigating your first steps into the workforce can be intimidating. Many students struggle with questions like the following:

- What types of positions do data scientists have?
- What are the programming, data visualization, and modeling software knowledge requirements for entry-level data science jobs?
- What specialized knowledge do I need of the industry or field I'd like to enter?
- What traits are employers looking for in the interview process?
- What does a typical day at work as a data scientist look like?
- How will data science careers change over time?

If you are grappling with similar questions, tune in to *Data & Science with Glen Wright Colopy* (*https://podofasclepius.podbean.com*). *Data & Science* is a podcast series sponsored by the American Statistical Association in which Glen and his guests answer questions from undergraduate, graduate, and doctoral students about careers in data science.

Glen has worked as a machine learning scientist since 2010 in the health care, biomedical, and pharmaceutical industries. In 2018, he graduated from the Computational Health Informatics Lab (CHI) at the Oxford Institute of Biomedical Engineering (IBME) and began working in the industry full time.

Here are three episodes to help answer some of your questions:

- **10 Beginner Questions**

  www.youtube.com/watch?v=ftikMj7MoYM

  Learn what technical programing skills, domain knowledge, and degrees are required to start a career in data science.

- **Q&A for Undergrads**

  www.youtube.com/watch?v=Nd3fvAILfMk

  You've acquired an undergraduate degree in data science. Now what? Learn everything you need to know about transitioning from student to professional.

- **Data Science Job Search**

  www.youtube.com/watch?v=jsxXvxX6FTY

  If you're looking to enter the data science workforce, this episode discusses how to navigate the job search process.

If you still have questions, subscribe to the podcast and submit them for future episodes. In the meantime, check out the ASA Committee on Career Development's webinar series (*https://community.amstat.org/ccd/ccdblog/earlycareerjobsearch*), particularly "Early Data Science Careers and the Job Search Process" and "Career Next Steps and Promotions." ■

Editor's Note
This article originally appeared on *This*IsStatistics (*thisisstatistics.org*). It is reprinted here with permission.

STATS4GOOD

UN International Computing Centre Supports Global D4G Projects

With a PhD in statistical astrophysics, **David Corliss** is lead, Industrial Business Analytics, and manager, Data Science Center of Excellence, Stellantis. He serves on the steering committee for the Conference on Statistical Practice and is the founder of Peace-Work, a volunteer cooperative of statisticians and data scientists providing analytic support for charitable groups and applying statistical methods in issue-driven advocacy.

The United Nations International Computing Centre (UNICC) is an agency with global scope that provides data solutions for United Nations (UN) programs and initiatives. It covers a wide variety of areas in Data for Good—from health initiatives to poverty and hunger programs to sustainable development goals and more—through three main channels: client services; information security; and analytics and data management.

UNICC partners with many organizations and governments around the world, which makes it a valuable resource for Data for Good initiatives. Learn more about UNICC and its resources at *www.unicc.org*.

In addition to providing data services and infrastructure for UN organizations and initiatives, UNICC organizes hackathons and other events with participation from teams worldwide. In February, UNICC's data and analytics program hosted its first global hackathon with 140 participants in 54 teams from 13 countries.

Teams of university students worked on Data for Good challenges in one of three areas: finding patterns in the COVID-19 pandemic; predicting forced displacement; and creating data visualizations on UN achievements. Teams worked with UNICC subject matter experts from the UN refugee and development programs. Several leading tech companies supported the hackathon, including Amazon, Microsoft, and Google, giving hackathon participants the opportunity to work with their data and analytics teams, as well.

Six teams were selected as finalists and presented their work in a global virtual meeting. Winning entries included an all-female team from India with a data visualization on expenditures by UN organizations for gender equality. The award for the predicting forced displacement challenge went to a team from the University of Salento in Italy, which used a random forest regressor to find a solution.

UNICC also partnered with Columbia University to organize a thinkathon. This summer program saw teams of university students and alumni work together to develop and propose solutions addressing sustainable development goals. Unlike a hackathon, these are not exclusively technological solutions, but Data for Good can play a vital role.

For the first thinkathon, 17 teams developed projects in one of three areas: gender quality; cyber security; and disaster preparedness. Subject matter experts from UNICC, Columbia, and the private sector mentored each team. At the end of the summer, finalists gave a five-minute pitch for their projects to judges and a global audience. Team Agritech was the winner of the first thinkathon, with a disaster preparedness project for a sustainable disinfection system using ozone.

Getting Involved

An opportunity this month comes from *Chief Data Officer* (*CDO*) *Magazine*, which has announced a new awards program (*https://cdomagazine.secondstreetapp.com/Data-For-Good/gallery*) for Data for Good projects from around the world.

This is a great opportunity to show off service projects in industry. *CDO Magazine* is looking for projects that address "global challenges by using data to achieve a better and more sustainable future." Nominations are open now; submissions will be accepted through January 1, 2022. You can nominate your own project or one from another person or team. Nominations are featured on the *CDO* award website. Finalists and winners will be selected by voting on the website. So, submit a Data for Good project you support and vote for great D4G ideas.

The runner up and audience choice winners were both Data for Good projects. Logista Emergency Response developed a solution to collect logistic information following a disaster and providing it to response teams. The audience choice award went to The Bulb, a set of virtual networking platforms to fight discrimination and violence against women.

UNICC is a large organization with many career opportunities supporting UN goals, initiatives, and partnerships. You can see current opportunities and get details on their careers page at *www.unicc.org/working-with-us*. The page lists all openings, so you will need to screen for D4G positions. Since this is the UN, job postings are found from around the world, with many in New York City. Students interested in the work of UNICC will want to watch the internships posted at the bottom of the careers page. ■

MORE ONLINE
Learn more about Stats4Good by listening to the November episode of *Practical Significance*. Ron Wasserstein and Donna LaLonde interview both David Corliss and Statistics Without Borders Chair Davina Durgana. *magazine.amstat.org/podcast-2/*

Response to 'Demystifying Apportionment Computations for the US House of Representatives'

Michael Fay, ASA Member

I am writing about Tommy Wright's informative article about apportionment computations for the US House of Representatives in the July 2021 *Amstat News* (*https://magazine.amstat.org/blog/2021/07/01/computations-us-house*). The seemingly simple problem of apportioning representatives according to their population is not so obvious, and I enjoyed reading about the clever algorithm that uses tables of priority values (columns of state populations multiplied by respectively,

Rob Santos's article in the same issue has inspired me to write a response, since he wrote of the importance of speaking up when you have a different perspective. My perspective is as a US citizen with no voting representative in the US House of Representatives. Many people who live in the US do not know that the 691,533 (population is from the April 1, 2020, census) people from Washington, DC, have only a non-voting member of the House of Representatives and no senators.

Wright's article focused on the computational method to apportion members to the House, as required by law. I found myself thinking of a more theoretical democratic ideal, where each person in the US would have equal representation. Of course, this ideal was never a part of the founding US laws, despite the claims in the Declaration of Independence about all men being created equal. This is clear when we examine the first full sentence of Article 3, Section 2, Clause 3 of the US Constitution (italicized parts were not included in Wright's article):

> Representatives *and direct Taxes* shall be apportioned among the several States which may be included within this Union, according to their respective Numbers, *which shall be determined by adding to the whole Number of free Persons, including those bound to Service for a Term of Years, and excluding Indians not taxed, three fifths of all other Persons.*

We see from the italicized section that the founding document is not a modern democratic ideal because indigenous [people] are not counted. Further, each enslaved person is counted as three-fifths of a person, is not allowed to vote, and, in fact, their enslavers get more representation from their votes because of enslaving them.

The US has made progress since that time, with slavery and involuntary servitude (except as a punishment for a convicted crime) ended by the 13th amendment. The right to vote was expanded (in principle) by constitutional amendments (the 14th and 15th amendment included males regardless of "race, color, or previous condition of servitude," the 19th amendment included women, and the 26th amendment included 18–20 year olds).

Although the 15th amendment was ratified in 1870, further laws were needed to enforce those rights (e.g., the 1965 Voting Rights Act). By 1924, Native Americans could have dual citizenship, and, by 1948, they had the right to vote regardless of whether they live on a reservation or not in Arizona and New Mexico (see Page 31 of Linda Monk's *The Words We Live By: Your Annotated Guide to the Constitution*).

A full discussion on the quest for justice in voting rights and representation is too much for this letter, but I thought a simple theoretical democratic ideal representation would be pertinent for *Amstat News* readers.

An ideal representation could be to have the federal legislative power distributed proportional to the populations living in their respective states or the District of Columbia (including US citizens from those areas currently living out of the country). We use the April 1, 2020, US Census apportionment population (plus the DC population; see Tables 2 and 3 of *www.census.gov/data/tables/2020/dec/2020-apportionment-data.html*).

We could operationalize the federal legislative power by having half go to the Senate (100 senators, 2 from each state)

Table 1—Representation Statistics for the 50 United States, Plus Its Capitol, Washington, DC

	Population (millions)[1]	Number of Representatives[2]	Pct Fed. Leg. Power	Percent Population	ratio
District of Columbia	0.69	0	0.00	0.21	0.00
California	39.58	52	6.98	11.93	0.58
Texas	29.18	38	5.37	8.80	0.61
Florida	21.57	28	4.22	6.50	0.65
New York	20.22	26	3.99	6.09	0.65
Pennsylvania	13.01	17	2.95	3.92	0.75
Illinois	12.82	17	2.95	3.86	0.76
Ohio	11.81	15	2.72	3.56	0.77
Georgia	10.73	14	2.61	3.23	0.81
Michigan	10.08	13	2.49	3.04	0.82
North Carolina	10.45	14	2.61	3.15	0.83
New Jersey	9.29	12	2.38	2.80	0.85
Virginia	8.65	11	2.26	2.61	0.87
Washington	7.72	10	2.15	2.33	0.92
Arizona	7.16	9	2.03	2.16	0.94
Massachusetts	7.03	9	2.03	2.12	0.96
Tennessee	6.92	9	2.03	2.08	0.98
Indiana	6.79	9	2.03	2.05	0.99
Maryland	6.19	8	1.92	1.86	1.03
Missouri	6.16	8	1.92	1.86	1.03
Wisconsin	5.90	8	1.92	1.78	1.08
Colorado	5.78	8	1.92	1.74	1.10
Minnesota	5.71	8	1.92	1.72	1.12
South Carolina	5.12	7	1.80	1.54	1.17
Alabama	5.03	7	1.80	1.52	1.19
Louisiana	4.66	6	1.69	1.40	1.20
Kentucky	4.51	6	1.69	1.36	1.24
Oklahoma	3.96	5	1.57	1.19	1.32
Oregon	4.24	6	1.69	1.28	1.32
Connecticut	3.61	5	1.57	1.09	1.45
Utah	3.28	4	1.46	0.99	1.48
Iowa	3.19	4	1.46	0.96	1.52
Nevada	3.11	4	1.46	0.94	1.56
Arkansas	3.01	4	1.46	0.91	1.61
Mississippi	2.96	4	1.46	0.89	1.63
Kansas	2.94	4	1.46	0.89	1.65
New Mexico	2.12	3	1.34	0.64	2.10
Idaho	1.84	2	1.23	0.55	2.22
Nebraska	1.96	3	1.34	0.59	2.27
West Virginia	1.80	2	1.23	0.54	2.27
Hawaii	1.46	2	1.23	0.44	2.79
New Hampshire	1.38	2	1.23	0.42	2.96
Maine	1.36	2	1.23	0.41	2.99
Rhode Island	1.10	2	1.23	0.33	3.72
Delaware	0.99	1	1.11	0.30	3.73
Montana	1.09	2	1.23	0.33	3.76
South Dakota	0.89	1	1.11	0.27	4.17
North Dakota	0.78	1	1.11	0.23	4.74
Alaska	0.74	1	1.11	0.22	5.03
Vermont	0.64	1	1.11	0.19	5.75
Wyoming	0.58	1	1.11	0.17	6.40

1. These statistics do not include the US territories: Puerto Rico, American Soma, Guam, Northern Mariana Islands, US Virgin Islands.
2. Washington, DC, and the five territories (Puerto Rico, American Soma, Guam, Northern Mariana Islands, US Virgin Islands) each have one nonvoting representative.

and half going to the House of Representatives (435 voting members). In our calculations, we will give no power to nonvoting members. Then, for each of the 50 states, we define the proportion of federal legislative power as

$$\left(\frac{1}{2}\right)*\left(\frac{2}{100}\right)+\left(\frac{1}{2}\right)*\left(\frac{\#\,Reps}{435}\right)$$

and we compare this to the ideal proportion of federal legislative power as the proportion of the population in each of the 50 states or DC by the April 1, 2020, Census apportionment counts (but with the DC population included). To compare relative power, we take the ratio of the percentage of federal legislative power over the ideal. We sort the data from the least powerful per person to the most powerful compared to the ideal (see Table 1).

For example, each resident of Wyoming has 6.4 times more power than if their power was proportional to their population size, while each resident of California has 0.58 times the power they would have gotten if given power proportional to their population size. Those in the District of Columbia have no federal legislative power.

This ideal is, of course, just one theoretical ideal for representation, and other people (e.g., those from Puerto Rico and other US territories) may have ideas for a better, more just, representation. Like all good democracies, the US allows for changing of its laws, including how its representatives are composed, and it allows for its people to express their ideas of how to change them. So, this exercise of imagining a more just democracy is, in fact, an example of a well-functioning democracy. Of course, the real ideal is changing the laws to make it better. ■

CSP 2022 to Take Place in New Orleans, Focus on Solving Real-World Problems

MORE ONLINE
To keep up with the latest CSP news, follow ***@AmstatNews*** on Twitter; use **#CSP2022.**

The Conference on Statistical Practice (CSP) will take place in New Orleans, Louisiana, February 1–3 and provide opportunities for attendees to further their career development and strengthen relationships in the statistical community.

With its focus on the application of statistics to solve real-world problems, CSP brings together hundreds of statisticians, data analysts, researchers, and scientists each year. Sessions focus on the following four key themes, which are relevant to those working in the application of statistics and data science in their daily work:

- **Theme 1:** Career, Professional, and Leadership Development
- **Theme 2:** Study Design and Data Management
- **Theme 3:** Implementation and Analysis
- **Theme 4:** Effective Communication

In addition to sessions, CSP offers practical computing demonstrations (free to registrants) and short courses and tutorials for an additional fee. Interested in mentoring or being mentored? CSP also offers a mentor-matching system. After registering, you will receive information about how to participate. The close-knit atmosphere of CSP is ideal for fostering a comfortable learning and networking environment.

Don't miss the ASA's 2022 president, Kathy Ensor, give the keynote address, "Urban Analytics and the Leadership Role of Statisticians." She will highlight statistical engineering solutions to complex problems in urban analytics, bringing forward the need for sound scientific reasoning and statistical methodologies to support that reasoning. She will also take the opportunity to provide updates on the ASA and the critical leadership role statisticians play in society.

Registration is open at *ww2.amstat.org/csp*. Questions may be sent to *meetings@amstat.org*. ■

Researcher and statistician **D. Anthony Miles** recently reached a milestone in his career when he won the Best Paper Award for his applied statistics research in marketing and economics at the 2021 Academy of Business Research Conference (ABR)—marking a record of 21 awards over 10 years at this national conference.

D. Anthony Miles

All Miles's awards are for his applied multivariate statistics research in marketing and economics. The scope of his research includes marketing, consumer behavior, and political marketing and voter behavior.

In 2011, he won his first Best Paper Award for research on predictive analytics in entrepreneurial risk patterns that cause failure in small business enterprises. Last year, he won the Best Paper Award four times, and he won it three times in 2019. Mostly notably, in 2020, his research team won the Best Paper Award for their four-year study on the 2020 presidential election and key predictive analytics in candidate attributes that predict voter behavior and election wins.

Miles was asked to be part of an IBM- and SPSS-sponsored industry event, "How Industry Experts Are Using IBM SPSS Statistics for Better Outcomes," in 2020. He was one of four industry statistics experts interviewed for the white paper and podcast about using SPSS for their statistics research.

Miles recently agreed to join the editorial review board for ABR's new journal, the *Journal of Data Analytics*. ■

ASA Fellow **Hollylynne S. Lee**, professor of mathematics and statistics education in the North Carolina State College of Education and senior faculty fellow at the Friday Institute for Educational Innovation, has been selected as one of three finalists for Baylor University's 2022 Robert Foster Cherry Award for Great Teaching.

The Cherry Award is designed to honor great teachers and encourage departments and institutions to value their own great teachers. The recipient of the Cherry Award will receive a prize of $250,000 and teach in residence at Baylor University during the 2022 fall or 2023 spring semester; travel expenses and a furnished apartment will be provided. To further Baylor University's commitment to great teaching, the award recipient's home department will receive $25,000.

Read more about Lee's work and her thoughts about the Cherry Award at *bit.ly/3G0PIcj*. ■

The 36th Rafto Prize was awarded to the **Human Rights Data Analysis Group (HRDAG)** for their work on uncovering large-scale human rights violations. By using statistics and data science, HRDAG documents human rights violations that might otherwise go undetected. Their approach has enabled courts to bring perpetrators to justice and given closure to affected victims and their families.

HRDAG seeks to uphold credible information as a foundation of human rights advocacy and justice and, by doing so, represent a new generation of human rights defenders advancing the enforcement of human rights globally.

HRDAG also promotes accountability for human rights abuse. Evidence is crucial in demanding accountability and justice. Systematic documentation of human rights violations exposes the scope of transgressions. This is central to putting an end to impunity for perpetrators and vital for the protection and empowerment of human rights activists on the frontline. HRDAG's rigorous methods and analyses also ensure every death is counted and a minimum standard of human dignity is upheld.

The HRDAG team, including ASA members Megan Price and Patrick Ball, consists of a small group of dedicated experts in computer science, software development, mathematical and applied statistics, and demography. In their work, HRDAG team members partner with human rights defenders, experts, and organizations worldwide.

The Rafto Prize aims to highlight the importance of HRDAG and other human rights defenders' work to seek and uphold the truth as a foundation of human rights advocacy and justice. HRDAG is being recognized for its pioneering approach and commitment to detecting and deterring human rights violators by providing reliable scientific documentation.

Read more about the prize at *bit.ly/3BSXrqo.* ■

ICSA Photo Contest Winners Capture Nature's Beauty

The 2021 International Chinese Statistical Association (ICSA) Applied Statistics Symposium's social activity committee hosted a famous landmarks photo contest during the virtual conference, September 12–15. ICSA members and registered attendees were asked to capture an authentic image of a famous landmark anywhere in the world. Following are the prize winners and the famous landmarks their winning photos captured:

MORE ONLINE
For more information about the ICSA symposium, visit *symposium2021.icsa.org.*

First Place
Sayar Karmakar, University of Florida
Famous landmark: The Dark Hedges, King's Road, Liscannor, Ireland (*bit.ly/3n38dUB*)

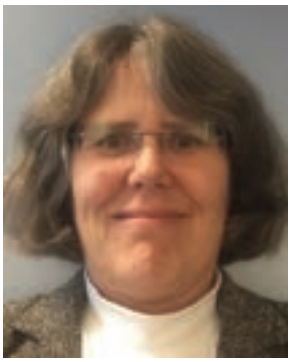
Second Place
Qiwei Li, The University of Texas at Dallas
Famous landmark: Bixby Creek Bridge, Monterey, California (*bit.ly/3DJWOjo*)

Third Place (Tied)
Li Wang, AbbVie
Famous landmark: Kitch-iti-kipi, a natural spring in Manistique, Michigan (*bit.ly/3DUBuYm*)

Third Place (Tied)
Junjing ("Jane") Lin, Takeda Oncology
Famous landmark: Diamond Beach (a.k.a. Breiðamerkursandur or Fellsfjara), Hornafjörður, Iceland (*bit.ly/3n8w4SO*)

Carol V. Caldwell Honored with 2021 Jeanne E. Griffith Mentoring Award

Carol Caldwell was honored October 13 with the 2021 Jeanne E. Griffith Mentoring Award during a virtual ceremony hosted by the Interagency Council on Statistical Policy (ICSP). This year marked the 19th annual presentation of the award and the 13th year the Government Statistics Section (GSS) has managed the award process.



Carol Caldwell

Caldwell served as chief of the US Census Bureau's Economic Methods Division until she retired this past summer. All her nominators characterize Caldwell as an extraordinary mentor, who provided formal and informal guidance to junior—and not-so-junior—staff as a direct supervisor, a participant in the US Census Bureau's formal mentorship program, and a colleague with an open door policy.

Her nominators consistently point out that when the Economic Directorate reorganized in 2014, Caldwell was selected to be the chief of this new division that brought programmatically dispersed mathematical statisticians together under one umbrella. With no road map to follow, Caldwell defined the position as an advocate representing the mathematical statistician's role in the survey life cycle as a member of the directorate's senior leadership team.

Caldwell's advocacy led to the creation of the senior mathematical statistician for economic programs position, reporting directly to the associate director. Those Caldwell has mentored have affected the federal statistical system and beyond, receiving the Census Bureau's and Commerce Department's highest awards, becoming ASA Fellows, and mentoring their staffs in an effort to "pay it forward."

Caldwell is commended for promoting a "family friendly" atmosphere and reducing the stress of maintaining a professional work-life balance. Many of her mentees attribute Caldwell's supervision to their professional success. Her nominator notes that, as a mentor, Caldwell is an "unsung hero." She is recognized by all her peers as an outstanding supervisor who coaches her staff to become credible and critical researchers with strong administrative skills. They are distinguished by promotions and awards, thus making her deserving of this mentoring award.

The Award

The Jeanne E. Griffith Mentoring award honors Griffith, who died in 2001 after working for more than 25 years in the federal statistical system. It acknowledges supervisors, technical directors, team coordinators, or other members of federal, state, and local government statistical staff who make unique efforts to mentor and encourage younger staff at all levels to learn and grow and to recognize and seize career opportunities.

The award includes a plaque and $1,000 honorarium. Nominations for the 2022 award can be submitted beginning January 2, 2022. Questions about the award may be sent to Rick Peterson at *rick@amstat.org* or Rajeshwari Sundaram at *sundaramr2@mail.nih.gov*. ■

Obituary

Lai Kow Chan

Submitted by Christian Genest, McGill University, and John F. Brewster, University of Manitoba

Lai Kow Chan, a longtime member and fellow of the ASA who was praised for his work in quality assurance and his academic leadership, passed away at home on December 23, 2020. He was 80.

Lai Kow Chan

Home for Lai was Hong Kong, where he was born on November 5, 1940. After graduating from Hong Kong Baptist College in 1962, he completed his education at the University of Western Ontario with an MA in 1964 and a PhD in 1966. He then taught at the University of Toronto for one year before returning to London, Ontario, where he was offered a tenure-track position. Over the next 15 years, he progressed through the ranks and published regularly in statistics and actuarial journals on popular topics such as distribution theory, estimation, and asymptotics.

The first major climacteric in Lai's career occurred in 1980, when he was recruited as head of the department of statistics at the University of Manitoba. To give a new impetus to the group, he proposed statistical quality control as a common research topic and walked the talk by reorienting his own work in this direction. His success is epitomized by a 1988 paper by Lai, Smiley Cheng, and Fred Spiring (who was then a PhD student) on the *Cpm* (also called Taguchi) capability index. This paper became a classic.

During Lai's 14-year headship, the department's reputation in quality management rose steadily and awareness of the use of statistical methods for quality improvement was raised within the Winnipeg business community by the dozens of workshops on statistical process control, total quality, and industrial experimental design given by department members. The group also hosted the 1985 Annual Meeting of the Statistical Society of Canada (SSC), and Lai served on both the SSC board of directors (1985–1987) and as editor-in-chief of *The Canadian Journal of Statistics* (1992–1994). The International Statistical Institute also benefited from his membership on council.

A second decisive moment in Lai's career occurred in 1994, when he chose to go home only a few years before the hand over of Hong Kong to China. He accepted a position as professor and chair of applied statistics and operational research at City University of Hong Kong (CUHK) and served as both the head of the department of management sciences (1994–1997, 2000–2001) and dean of the faculty of business (2001–2006). Under his leadership, the CUHK College of Business reached unprecedented heights in business education and research. Various new programs were launched, and he spearheaded the college's effort in achieving AACSB accreditation in 2005.

Eager to support the development of statistics in China, Lai supervised several PhD students during this period. He also coauthored influential work, notably with Ming-Lu Wu, on quality function deployment. Among many other commitments, he acted as an adviser on statistics teaching material for China's State Statistical Bureau and served on the Statistics Advisory Board for the Commissioner for Census and Statistics of the Hong Kong SAR.

A third critical turn in Lai's career occurred in 2006 when, at the age of 66, he took up the challenge of helping build the Macao University of Science and Technology in its formative years. Besides serving as director of the Institute for Sustainable Development (2006–2017), he was vice president (2007–2011) and dean of the school of business (2009–2014). He was also adviser for the sustainable economic development strategy and Pearl River Delta Region development plan for several departments in the Macao SAR government. Moreover, drawing on experience acquired in Hong Kong with the design of economic indexes such as the

Centa-City Property Index (1999), Lai was involved in setting up Macao's consumer confidence and satisfaction indexes (2007–2008).

Needless to say, Lai's outstanding record of research and service earned him much acclaim. He was an elected member of the International Statistical Institute (1979) and became a fellow of the American Statistical Association (1981), Institute of Mathematical Statistics (1985), American Society for Quality (1990), and American Association for the Advancement of Science (1991). He was also a fellow of the UK Institute of Mathematics and Its Applications.

Lai was not only an esteemed scholar and a visionary leader but also a meticulous, good-natured person who inspired confidence and genuinely cared for his fellow human beings. He was energetic, passionate, and persuasive. He drew inspiration from quality guru W. Edwards Deming and Hong Kong's visionary entrepreneur and philanthropist Sir Gordon Wu.

Surviving Lai are his wife of more than 50 years (Fung-Yee), their three children (Bertha, David, Leo), and five grandchildren who were his greatest pride. We were lucky to have crossed his path. He will be greatly missed but forever remembered.

Obituary

James Walsh III

James A. Walsh III, retired professor of psychology from the University of Montana, died August 1, 2021, of natural causes in Shelton, Washington.

James was a member of the first cohort of National Merit Scholar awardees (1956–1960), where he met his lifelong love and partner, Roberta Blake Walsh. He earned his degrees and carried out his training at the University of Washington (PhD, 1963, psychology). He was a professor of psychology and statistics at Iowa State University from 1965–1972, becoming the youngest full professor (at the time) promoted to that level by the university.

James served as chair of the psychology department at the University of Montana from 1972–1976 and continued to serve in that department until his retirement in 1999. He was a noted expert and consultant on the statistical methods underlying test construction, in particular for mental measurement and educational evaluation. He consulted broadly at state, regional, and national levels for public agencies and private industry.

Over the course of his career, James served on the editorial boards of several leading journals in his field, including *Criminal Justice and Behavior, Educational and Psychological Measurement, Psychological Reports*, and *Perceptual and Motor Skills*. He also provided review services to a host of other journals and state and federal funding agencies. He was the author of 52 journal papers and invited book chapters, 50 conference and symposium papers, and numerous invited addresses.

James was a highly regarded teacher and mentor, receiving the University of Montana Distinguished Teaching Award in 1989. He was proud that he led the faculty of the University of Montana system to unionize, protecting his peers and their students from the depredations of the state legislature.

James loved fly fishing in Montana and his family. He is survived by his wife, Roberta; their two children, Jennifer Weller and Robert Walsh; and his granddaughter, Melissa Boies.

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

AWARD	DEADLINE	QUESTIONS & NOMINATIONS
John J. Bartko Scholarship Award	December 2	Questions: Donna LaLonde (*DonnaL@amstat.org*) Nominations: *awards@amstat.org*
COPSS Distinguished Lectureship Award, Elizabeth L. Scott Award, and Presidents' Award	December 15	COPSS website (*community.amstat.org/copss/home*)
Monroe G. Sirken Award in Interdisciplinary Survey Methods Research	December 20	*awards@amstat.org*
Gottfried E. Noether Awards	January 15	*awards@amstat.org*
COPSS Leadership Academy Award	January 15	Richard Samworth (*r.samworth@statslab.cam.ac.uk*)
Karl E. Peace Award	February 1	*awards@amstat.org*
W.J. Dixon Award for Excellence in Statistical Consulting	February 15	*awards@amstat.org*
Harry V. Roberts Statistical Advocate of the Year Award	February 15	*awards@amstat.org*
Waller Awards	February 15	*awards@amstat.org*
Samuel S. Wilks Memorial Award	February 15	*awards@amstat.org*
W.J. Youden Award in Interlaboratory Testing	February 15	*awards@amstat.org*
Statistics in Physical Engineering Sciences Award	February 20	*awards@amstat.org*
Gertrude M. Cox Scholarship	February 23	*awards@amstat.org*
Edward C. Bryant Scholarship Trust Fund	March 1	*awards@amstat.org*
Excellence in Statistical Reporting Award	March 1	*awards@amstat.org*
ASA Fellows	March 1	*awards@amstat.org*
ASA Mentoring Award	March 1	*awards@amstat.org*
Outstanding Statistical Application Award	March 1	*awards@amstat.org*
Statistical Partnerships Among Academe, Industry, and Government (SPAIG) Award	March 1	*awards@amstat.org*
Annie T. Randall Innovator Award	March 15	Sherri Rose (*sherrirose@stanford.edu*)
Biopharmaceutical Section Scholarship Award	March 15	Biopharmaceutical Community Website (*community.amstat.org/biop/awards/scholarship*)
Founders Award	March 15	*awards@amstat.org*
ASA Pride Scholarship	March 31	Donna LaLonde (*donnal@amstat.org*)
Government Statistics Section Wray Jackson Smith Scholarship	April 1	David Banks (*banks@stat.duke.edu*)
Causality in Statistics Education Award	April 5	*awards@amstat.org*
Links Lecture Award	July 1	*awards@amstat.org*
Health Policy Statistics Section Achievement Awards	September 15	*www.asahealthpolicy.org/for-students*
Lester R. Curtin Award	October 15	*awards@amstat.org*
Deming Lecturer Award	October 15	*awards@amstat.org*
Lingzi Lu Memorial Award	October 15	*awards@amstat.org*

sectionnews

Biometrics Section Grant Helps Introduce Field to High-School Students

Michelle Shardell, professor at the Institute for Genome Science at the University of Maryland, Baltimore, was the recipient of the section's 2019 strategic initiatives grant, an effort funded annually to support projects developing innovative outreach to enhance awareness of biostatistics among quantitatively talented US students. Her project, "Introducing Biostatistics to Diverse Pathways in Technology Early College (P-TECH) Students Through Microbiome Data Analysis," aimed to develop and deliver a module introducing the biostatistics field and techniques to analyze microbiome data to quantitatively talented students enrolled in the P-TECH program at Dunbar High School in Baltimore, Maryland. Here, Shardell discusses the launch of the project and the challenges and progress made on the impact of biostatistics outreach amid the COVID-19 pandemic.

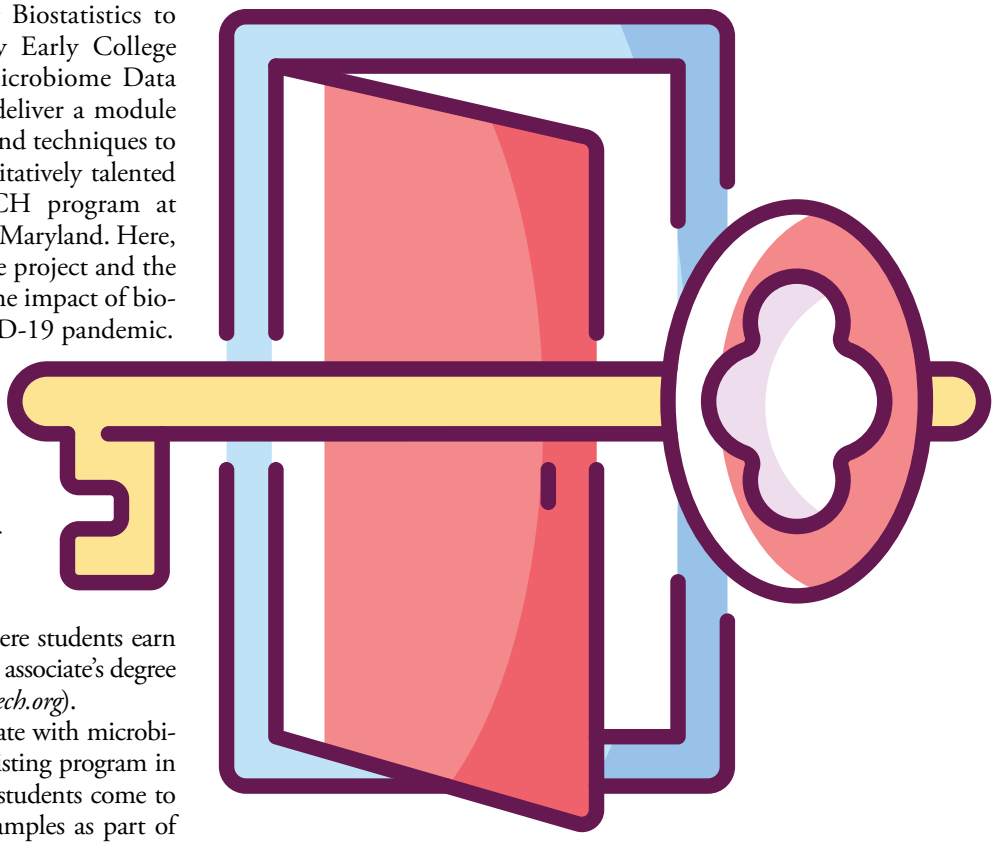
How It Started

Our original proposal was to host an in-person, hands-on quantitative activity for students enrolled in the P-TECH program at Dunbar High School in Baltimore, of which the University of Maryland, Baltimore (UMB) is a partner. P-TECH is a national program where students earn a high-school diploma and two-year associate's degree in a STEM field at no cost (*www.ptech.org*).

The project idea was to collaborate with microbiologist colleagues to build on an existing program in which approximately 30 P-TECH students come to the UMB campus to collect soil samples as part of a biology fieldwork experience. The samples are then used to generate soil microbiome data. This way, students can move from literally touching their data to performing simple data analysis as a palpable introduction to the biostatistics field.

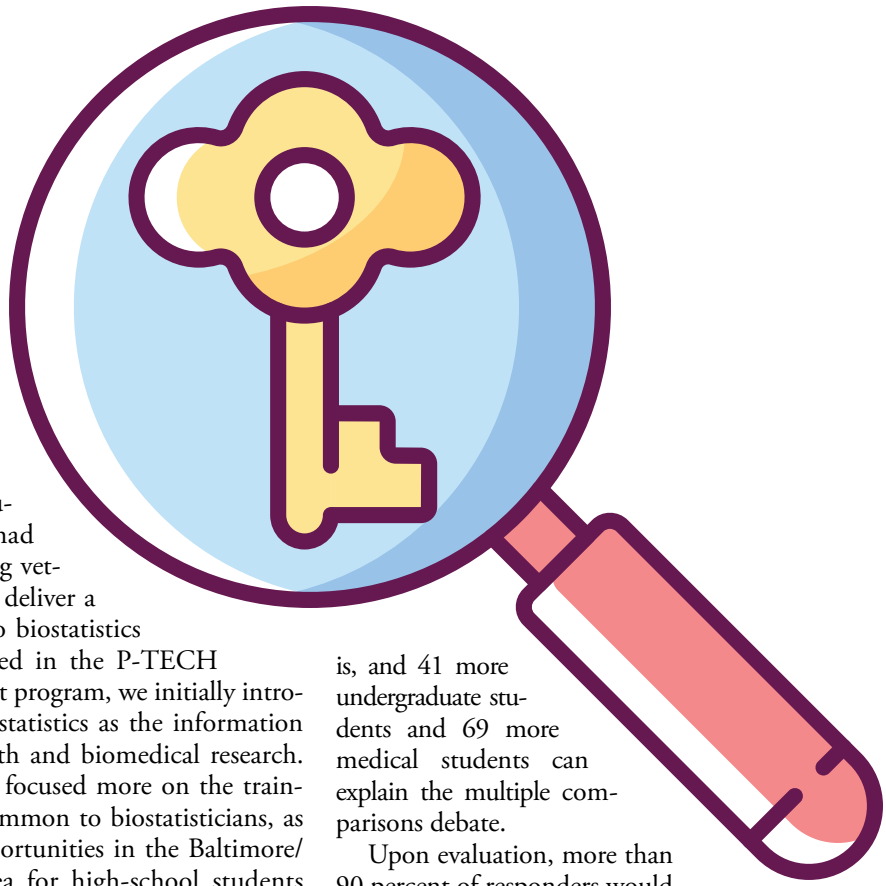
How It's Going

Once COVID-19 led to the cancelation of all in-person learning activities and a struggle for K–12 educators to cover their required curriculum—let alone enrichment activities—we needed a new plan. The first opportunity came in the summer of 2020 when the leaders of multiple University of Maryland School of Medicine summer enrichment programs that have historically focused on in-person laboratory experiences switched to a remote model focused on computational biology and bioinformatics content.



Given that these learners ranged from undergraduate students to medical students, we developed an activity to meet their needs. First, we introduced students to the role of biostatistics as the information science of biomedical and public health research. Next, to complement their exposure to biomedical research in the programs' journal club, we introduced them to *p*-values and the debate on multiple comparisons, as well as introductory R programming. To reinforce the content, we developed a web-based digital "escape room." The first

MORE ONLINE
For more information about the section's strategic initiatives grant, visit *https://community.amstat.org/biometricsbiom/award/sig.*



three students who completed the escape room won e-gift cards and special recognition.

By the spring of 2021, when K–12 students and faculty had become virtual learning veterans, we were able to deliver a virtual introduction to biostatistics to sophomores enrolled in the P-TECH program. As in our first program, we initially introduced students to biostatistics as the information science of public health and biomedical research. For these learners, we focused more on the training and job sectors common to biostatisticians, as well as internship opportunities in the Baltimore/Washington, DC, area for high-school students interested in biostatistics. We also adapted the web-based digital escape room to emphasize the definitions, training, and careers relevant to biostatisticians (again with gift card prizes). Last, we connected with another program, the UMB Continuing Umbrella of Research Experiences (CURE) Scholars Program, which aims to mentor students from West Baltimore from grade six through graduation. Notably, the UMB-CURE Scholars Program is the subject of a PBS documentary series.

For these learners, we covered generally the same topics as we did for the P-TECH program; however, we put greater emphasis on the role of biostatistics in interpreting COVID-19 data to be consistent with UMB-CURE program goals.

Impact: By the Numbers

Although we were not able to deliver a hands-on fieldwork activity in conjunction with biostatistics content, we were able to connect with a greater number and breadth of students than we had planned. Because of this outreach initiative, 83 more high-school students know what biostatistics is, and 41 more undergraduate students and 69 more medical students can explain the multiple comparisons debate.

Upon evaluation, more than 90 percent of responders would recommend the session, and interest in pursuing additional coursework or degree programs in biostatistics increased.

Learners indicated the digital escape room increased their ability to interpret *p*-values and address multiple comparisons, where one learner said, "I really liked the post-lecture online activity! It was so cute, and I think it was a great way to really reinforce the concepts that we'd just learned. Definitely one of my favorite activities that we've done so far :)."

Future Plans

The lectures for summer undergraduate and medical student programs were recorded and are now available for students in subsequent cohorts. Moreover, now that we have created content and built relationships with multiple local UMB partner programs, we aim to continue outreach work. These sessions will likely remain virtual in the near term for flexibility but may transition to something resembling the original plan. ■

sectionnews

Statistics and the Environment

Emily Kang, Eric Gilleland, and Candace Berrett

Maggie Johnson

Steve Sain

Ben Shaby

The Statistics and the Environment (ENVR) Section has been offering mentoring roundtables for graduate students since 2017. This event is usually organized annually with other ENVR activities at JSM. It is designed to encourage diverse participation and engage graduate students who may not normally have access to or interaction with more senior, advanced-career members of the ENVR community.

This year, ENVR hosted this roundtable virtually on August 10. **Maggie Johnson** from the Jet Propulsion Laboratory, **Steve Sain** from Jupiter Intelligence, and **Ben Shaby** from Colorado State University joined as mentors to eight graduate students from different universities.

The event began with a panel discussion with the students and all the mentors before breaking into small group sessions formed to foster engagement and maximize participation. Mentors shared with students their experiences across academe, industry, and national laboratories. They also provided suggestions for preparing for a career during graduate school, including gaining experience via internships and building skill sets (e.g., programming tools and software development).

Based on the feedback received, the event organizers are convinced students need such mentoring opportunities. Suggestions from students and mentors included making the event longer and providing ways for students to follow up with mentors.

Student Feedback

- "It was great to get different perspectives from statisticians working in environmental applications."
- "I really loved the structure and different career tracks represented. I liked how there was a general discussion with the large group and then breakouts for smaller groups. The size of the smaller groups (2–3 people) was also perfect, as it gave everyone a chance to ask questions."
- "The session was very interesting and interactive. The mentors shared their experiences and opinions about the available opportunities in industry as well as in academic field. That helped a lot for me to reconsider my future career plans." ■

Quality and Productivity

During the Quality and Productivity planning meeting at JSM, the section set dates for the 2022 Quality and Productivity Research Conference, which will take place June 13–16 in Mountain View, California, and San Francisco State University. The conference theme is "Data Science, Statistics, and Responsibility." Angela Schoergendorfer from Google and Alexandra Piryatinska from San Francisco State University will co-chair the event.

If you would like to work on developing social media strategies, contact Sarah Kalicin at *sarah.kalicin@gmail.com.*

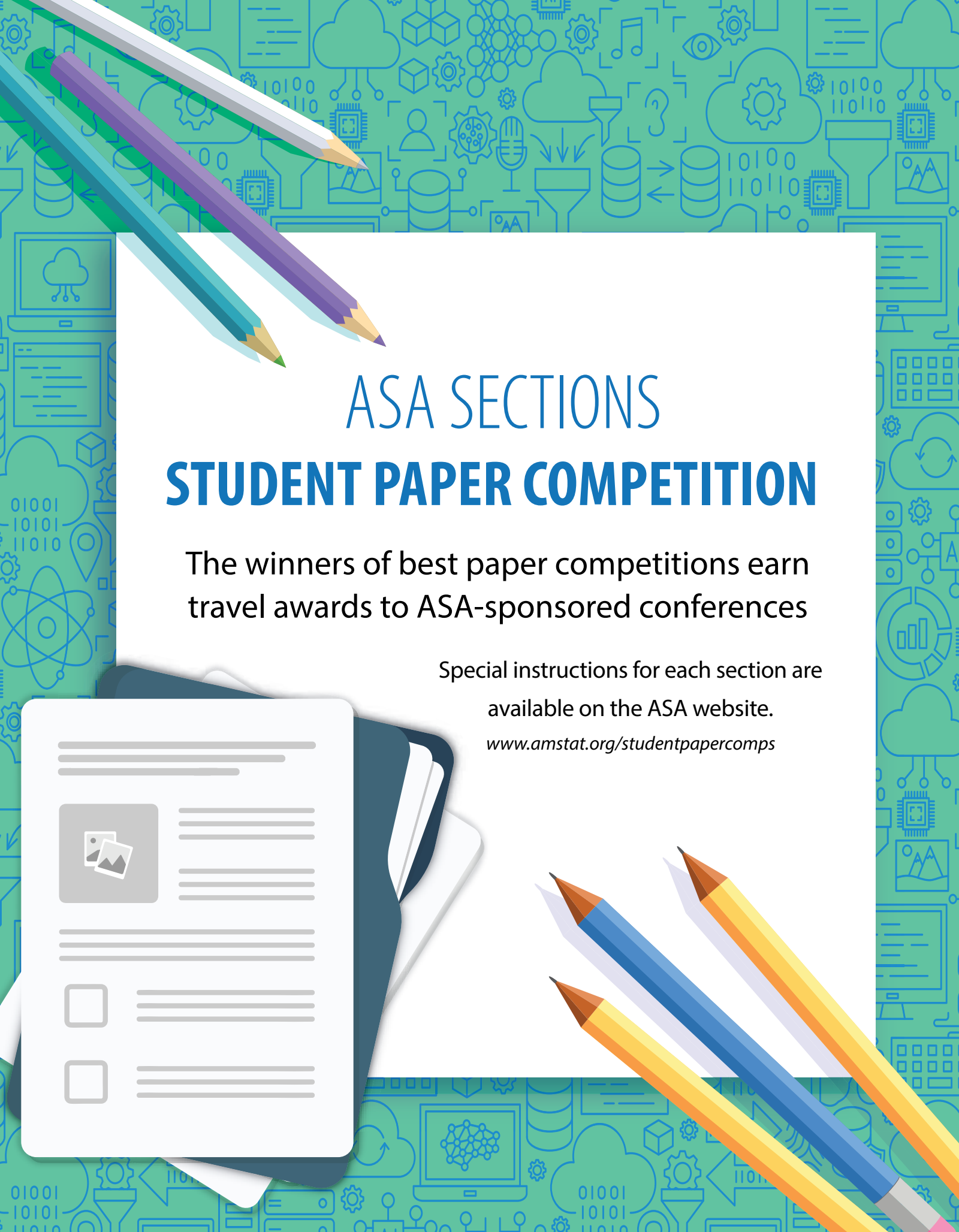
Anyone interested in participating in the Speakers Bureau, particularly to speak to precollege students, should visit *www.amstat.org/asa/speakers-bureau.aspx* and contact the ASA Director of Strategic Initiatives and Outreach Donna LaLonde at *donnal@amstat.org*. ■

ASA SECTIONS
STUDENT PAPER COMPETITION

The winners of best paper competitions earn travel awards to ASA-sponsored conferences

Special instructions for each section are available on the ASA website.

www.amstat.org/studentpapercomps



sectionnews

Statistics and Data Science Education

Jo Hardin and Maria Tackett

The Section on Statistics and Data Science Education has had a busy 2021, with members gathering online to continue promoting education in statistics and data science.

Ideas for getting involved with the section include participating in the mentorship program; giving a talk at JSM, eCOTS, or ICOTS; nominating yourself for the section's fellowship program (if you are a high-school or two-year college teacher); and running for an elected position. Of course, you can always attend the business meeting at JSM 2022.

Below are member highlights and accolades.

JSM 2021

The section had another engaging program at JSM under Program Chair **Jamie Perrett** and Program Chair-elect **Aimee Schwab-McCoy**. SSDSE sponsored nine invited paper/panel sessions, five topic-contributed paper/panel sessions, two contributed speed sessions, and 12 birds of a feather sessions. Handouts and slides from the business meeting are posted on the section's website at *https://community.amstat.org/statisticaleducationsection/home.*

Following are award honorees recognized at this year's conference:

- 2021 MAA Robert Hogg Award: **Mine Çetinkaya-Rundel,** Duke University
- 2021 Distinguished Teaching Career Award: **Lawrence M. Lesser,** The University of Texas at El Paso
- 2021 Waller Education Award: **Amelia A. McNamara,** University of St. Thomas
- 2021 Mu Sigma Rho William D. Warde Statistics Education Award: **Anna Bargagliotti,** Loyola Marymount University
- 2021 Mu Sigma Rho Early Career Undergraduate Award: **Samantha Robinson,** University of Arkansas
- 2020 Jackie Deitz Award for best *JSDSE* paper: **Lynette Hudiburgh,** Miami University, and **Diana Garbinsky**, RTI Health Solutions, for "Data Visualization: Bringing Data to Life in an Introductory Statistics Course"

Section members recognized as 2021 ASA Fellows are **Jeffery Blume, Thomas Braun, Amelia Haviland, Matthew Hayat, Stanislav Kolenikov, Weiwen Miao, Eric Vance**, and **Olga Vitek.**

Section Fellows

In 2019, the section started a fellowship program for high-school and two-year college teachers wanting to affect statistics education beyond their classrooms. The first fellows, **Amy Hogan** of Brooklyn Technical High School and **Kathy Kubo** of College of the Canyons, will complete their term in December. As part of the fellowship, Hogan curated a collection of resources for teachers interested in integrating social justice topics into their statistics courses. Kubo facilitated a series of statistics workshops (with Roxy Peck) titled, "Statistics Institute at College of the Canyons."

Section fellows for 2021–2022 are **Dione Maxwell** of Loganville High School and **Venessa Singhroy** of Queensborough Community College.

Section Officers

Recently elected section officers are the following:

- **Nathan Tintle**, Dordt University, Chair-elect 2022
- **Jennifer Broatch**, Arizona State University, Secretary/Treasurer 2022–2024
- **Jennifer Ward**, Clark College, and **Adam Loy,** Carleton College, Executive Committee At Large 2022–2024

Retiring officers, whose terms end December 31, include the following:

- **Michael Posner,** Past Chair
- **Jamie Perrett,** 2021 Program Chair
- **Jessica Chapman** and **Beverly Wood,** Executive Committee
- **Alyson Wilson,** COS Vice Chair

Mentoring Program

The section recently matched its sixth cohort of mentors/mentees. The mentoring program began in 2016 to connect experienced statistics educators with early-career educators to guide teaching, research, and professional development. There are 41 mentor/mentee pairings for 2021–2022. Applications for the next round of pairings will be available in the summer of 2022.

Continuing Education

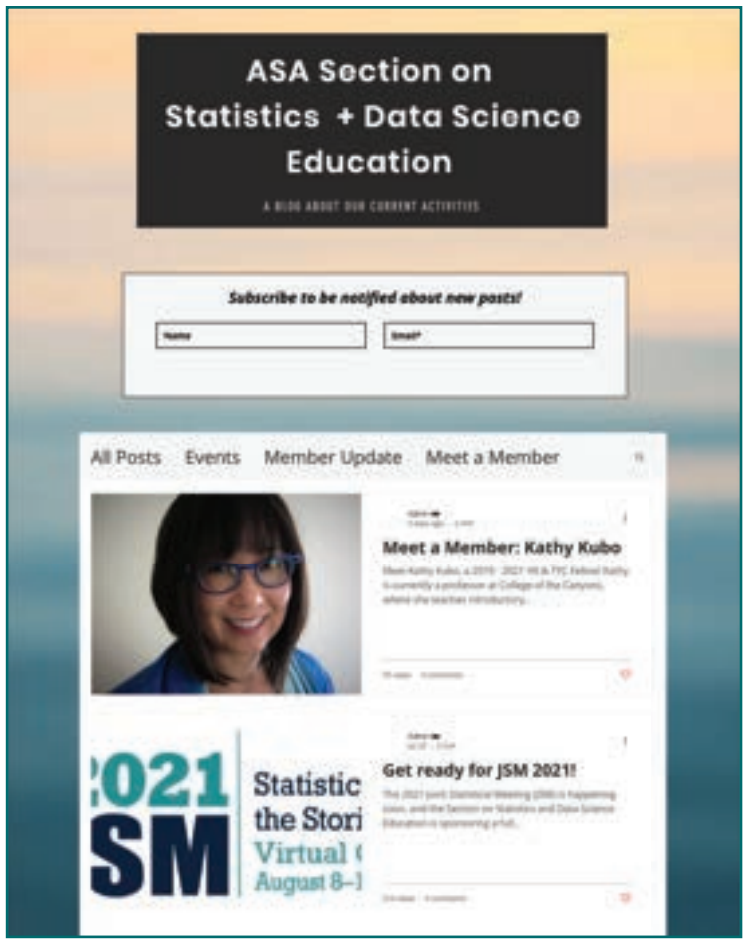
The Electronic Conference on Teaching Statistics (eCOTS) will be held online May 23–26, 2022. Pre-conference workshops will be held May 19–20, 2022. The theme for the 2022 conference is "Preparing the Modern Student." Find out more at *www.causeweb.org/cause/ecots/ecots22.*

The International Conference on Teaching Statistics (ICOTS) will be held September 11–16, 2022, in Rosario, Argentina. The theme is "Bridging the Gap: Empowering and Educating Today's Learners in Statistics." Find out more at *https://icots.info/11.*

Section Communication

The section website includes section initiatives, resources, and announcements for upcoming statistics education events. Visit it at *https://community.amstat.org/statisticaleducationsection.*

The section also has a blog that includes updates, announcements for upcoming events, and other news of interest to statistics and data science educators. Visit the blog at *https://statisticseducatio.wixsite.com/mysite.* ■

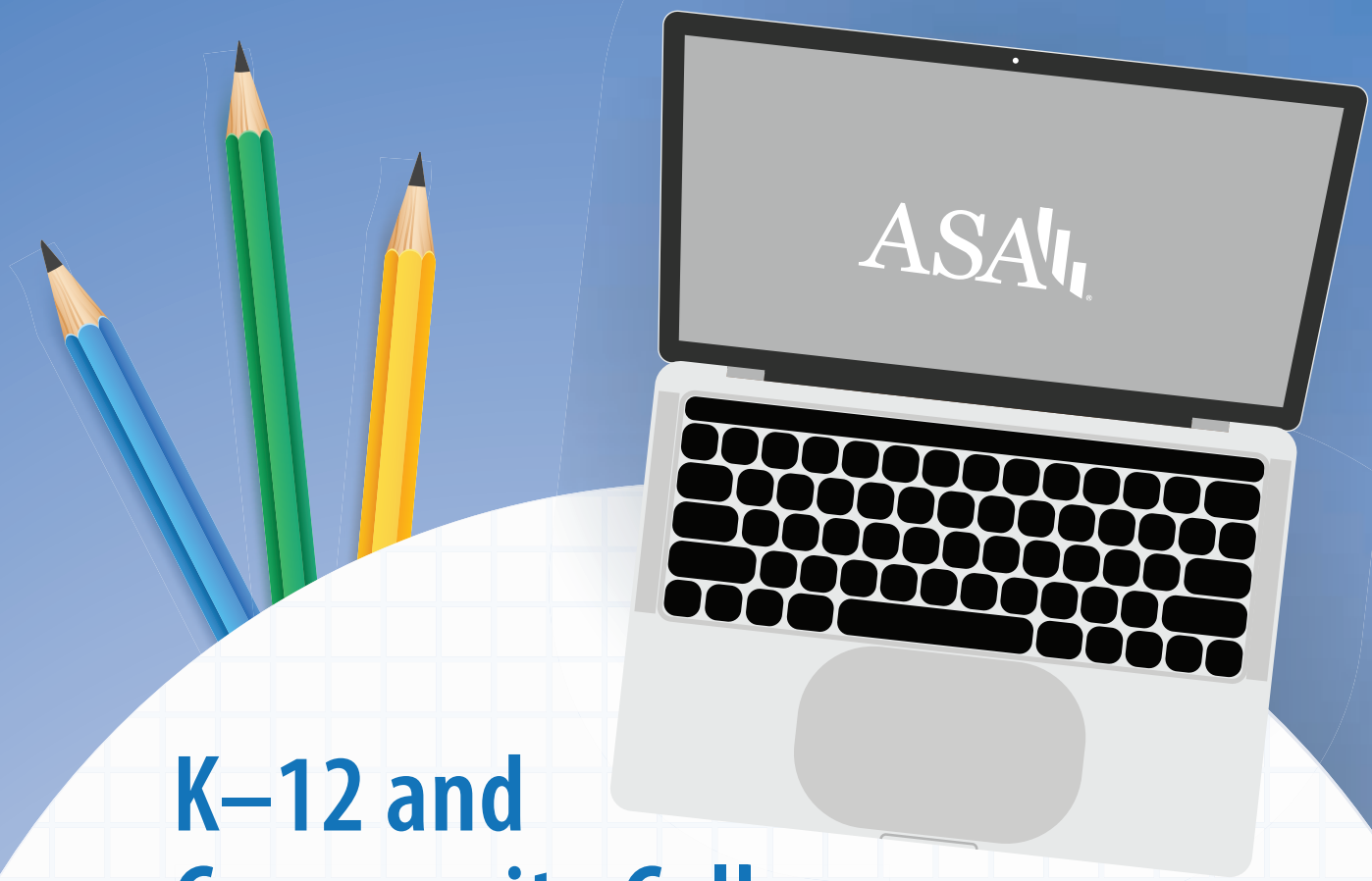


Visit the ASA Section on Statistics + Data Science Education blog at *statisticseducatio.wixsite.com/mysite.*

Government Statistics

The Government Statistics Section (GSS) sponsored four popular JSM invited sessions. There were two paper sessions titled, "Producing Official Statistics During a Pandemic: Advances Under Adversity" and "Collecting, Protecting, and Sharing COVID-19 Data and the Stories They Tell." Additionally, there were two invited panel sessions: "Building the Infrastructure for the Future of Official Statistics" and "The Independence of Federal Statistical Agencies."

GSS also sponsored seven topic-contributed sessions, including a student paper competition, and a roundtable session on missing data treatments for short-term statistics during a pandemic.



K–12 and Community College EDUCATORS:

ASA membership can help you enhance your students' statistical education!

When you sign up for a free trial membership, you will receive:

Access to **classroom resources, publications, guidelines, and reports**

Professional development through webinars and workshops

Peer-reviewed lesson plans

Access to the **ASA Community's K–12 discussion group**, where like minds share ideas, questions, and resources

Subscriptions to *Amstat News*, the ASA's monthly magazine, and *Significance*, a magazine aimed at international outreach and statistical understanding

Members-only access to the ASA's top journals and resources, including online access to *CHANCE* magazine, the *Journal of Statistics and Data Science Education,* and *The American Statistician*

Activate your free trial membership at *www.amstat.org/k12trial*.

* Free trial membership is valid for new ASA members only.

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A SECTION OR CHAPTER

EXPAND your professional network and strengthen your relationships in the community

EXPLORE chapter and section leadership opportunities

STAY CURRENT with the different methodologies and applications in your area of expertise

If you've been thinking about joining an ASA section or regional chapter, we have made it easier than ever. With a few clicks, you can add section and chapter membership and pay online.

Chapter and section membership can greatly enhance the value of your membership.

ASA

Add section and chapter membership at *ww2.amstat.org/membersonly/additems*.

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.

These listings and additional information about the 65-word ads can be found at *ww2.amstat.org/ads*.

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 *https://jobs.amstat.org/jobseekers*.

Institute of Statistical Science, Academia Sinica, Taiwan

Tenure-Track Faculty Positions

The Institute of Statistical Science of Academia Sinica is pleased to invite applications for our tenure-track faculty positions. Academia Sinica, the most preeminent academic research institution in Taiwan, offers a secured research environment facilitated with rich collaboration opportunities as well as the freedom of conducting independent research. With a strong tradition of theoretical and interdisciplinary research, the Institute of Statistical Science is aiming for global excellence in mathematical statistics and various statistical applications.

Applications are invited for tenure-track appointments as Full/Associate/ Assistant Research Fellows (equivalent to Full/Associate/Assistant Professors in Universities) at the Institute of Statistical Science to commence on August 1, 2022 or as soon as possible thereafter. Applicants should possess a Ph.D. degree in Statistics, Biostatistics, Computer Science, Data Science or related areas, and should submit: (1) a cover letter, (2) an up-to-date curriculum vita, (3) a detailed publication list, (4) a research proposal, (5) three letters of recommendation, (6) representative publications and/or technical reports and (7) advisers' names of master and PhD degrees. Additional supporting materials such as transcripts for new Ph.D. degree recipients may also be included. Electronic submissions are encouraged. Applications should be submitted to

Dr. I-Ping Tu
Chair of the Search Committee
Institute of Statistical Science,
Academia Sinica
128 Sec. 2 Academia Road, Taipei
11529, Taiwan, R.O.C.
Fax:+886-2-27886833
E-mail: recruit@stat.sinica.edu.tw

Application materials should be received by **December 31, 2021** for consideration, but early submissions are encouraged.

California

■ The Department of Statistics, University of California, Riverside, invites applications for a tenure-track Assistant Professor position, beginning July 1, 2022. Salary is competitive and commensurate with qualifications and experience. To apply: submit the following to *https://aprecruit.ucr.edu/apply/JPF01457*: Cover Letter, Curriculum Vitae, Statement of Teaching, Statement of Research/Scholarly Activities, Statement of Past and/or Planned Future Contributions to Advancing Diversity, and 3 Letters of Reference. EEO/AA/ADA/Vets Employer.

Illinois

■ Northwestern University, Department of Statistics invites applications for open rank tenure-track or tenured faculty position with expertise in data science, broadly defined, and experience/interest in big data analysis. Will teach 4 courses a year, conduct research, mentor students, participate in department activities. PhD in statistics/biostatistics/related fields required. Apply at *https://statistics.northwestern.edu/about/faculty-search-.html*. Review of applications begins Dec 1, 2021. Appointment, September 2022. Questions: Kisa Kowal at *k-kowal@northwestern.edu*. Northwestern University is an Equal Opportunity, Affirmative Action Employer of all protected classes, including veterans and individuals with disabilities. Women, racial and ethnic minorities, individuals with disabilities, and veterans are encouraged to apply. Hiring is contingent upon eligibility to work in the United States.

Massachusetts

■ Company name: Babson College. Job Title: Business Analytics Lecturer
The lecturer will also likely have the chance to teach introductory quantitative methods courses in any of our several master's degree programs, or higher level undergraduate or graduate courses. For additional information, please visit: *www.click2apply.net/KM4EjqU6q2bqfBxghX6ln*. EOE

New York

■ The Department of Biostatistics at Columbia University's Mailman School of Public Health seeks applicants for multiple open-rank tenure-track or tenured faculty position(s). Competitive candidates will hold a doctorate degree in biostatistics, statistics, or a related quantitative field by the start date. Review of applications begins in fall 2021. Submit requested materials as posted at: *Apply.interfolio.com/91898*. Columbia University is an Equal Opportunity/Affirmative Action employer—Race/Gender/Disability/Veteran.

New Jersey

■ Statistics Department of Rutgers University seeks outstanding applicants for an assistant professor or associate professor position starting fall 2022. Applicants must have a PhD in statistics or related field by September 1, 2022. Responsibilities include: teaching/overseeing both undergraduate and graduate programs in statistics, conducting original research in statistics; particular emphasis on statistical learning and data science are preferred. Pursuit of external research funding is expected. Apply online *https://jobs.rutgers.edu/postings/142285.* EOE.

Pennsylvania

■ The Wharton Statistics and Data Science Department, University of Pennsylvania, has a full-time, tenure-track assistant professor position, beginning July 2022. Applicants must show outstanding research and teaching skills. Candidates must have a PhD or equivalent (expected completion by June 30, 2023 is acceptable) from

Columbia University Department of Statistics

Assistant Professor (Limited Term)

Positions starting Fall 2022

Position Description

The Department of Statistics invites applications for multiple four-year term positions at the rank of Assistant Professor to begin July 1, 2022. A PhD in statistics or a related field by the date of appointment 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. Candidates with expertise in machine learning, big data, mathematical finance and probability theory are particularly encouraged to apply.

The department expects to support successful candidates with a generous research allowance. The expected teaching load is three semester-long courses per year.

The department currently consists of 30 faculty members and 59 PhD students. The department has been expanding rapidly and, like the University itself, is an extraordinarily vibrant academic community. We are especially interested in candidates who, through their research, teaching and/or service will contribute to the diversity and excellence of the academic community. Women and minorities are especially encouraged to apply. 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

Qualifications

PhD in statistics or a related field by the date of appointment is required, as is a commitment to high quality research and teaching in statistics and/or probability.

Application Instructions

All applications must be submitted through Columbia's online Academic Search and Recruiting portal (ASR) apply.interfolio.com/94211

The application must include a cover letter, curriculum vitae, teaching statement, research statement and the names of 3 references, who will be asked to upload letters of recommendation.

Inquiries may be made to Dood Kalicharan at dk@stat.columbia.edu

Review of applications begins on December 1, 2021, and will continue until the position is filled.

Equal Employment Opportunity Statement
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COLUMBIA UNIVERSITY DEPARTMENT OF STATISTICS

LECTURER IN DISCIPLINE STARTING FALL 2022

Position Description: The Department of Statistics invites applications for multiple positions at the rank of Lecturer in Discipline that begins January 1, 2022 or July 1, 2022. These are full-time appointments with multi-year renewals contingent on successful reviews. These positions will contribute to the Departmental educational mission at the undergraduate and masters level. Lecturers in Discipline are officers in the University who meet a programmatic need for instruction in specialized fields. The selected candidates will be expected to teach up to 3 courses per semester. A Ph.D. in Statistics or related field by the date of appointment and a commitment to high-quality teaching at both the undergraduate and MA levels in Statistics and/or Probability are required. Experience with online education is desirable but not required. Candidates will be expected to participate in the full gamut of statistics education including curriculum improvement, modifying and developing courses, and exploring new strategies for the teaching of statistics.
The Department currently consists of 30 faculty members, 59 PhD students, and over 300 MA students. The Department has been expanding rapidly and, like the University itself, is an extraordinarily vibrant academic community. We are especially interested in candidates who through their research, teaching and/or service will contribute to the diversity and excellence of the academic community. Women and minorities are especially encouraged to apply. For further information about the Department and our programs, please go to our webpage at: http://www.stat.columbia.edu

Qualifications: A Ph.D. in Statistics or related field by the date of appointment and a commitment to high-quality teaching

Application Instructions: All applications must be submitted through Columbia's online Academic Search and Recruiting portal (ASR) apply.interfolio.com/93827 and must include the following materials: cover letter, curriculum vitae, statement of teaching philosophy, research statement, evidence of teaching effectiveness (teaching evaluations), a sample of course syllabus and the names of 3 references, who will be asked to upload letters of recommendation on their behalf.

Inquiries may be made to Dood Kalicharan at dk@stat.columbia.edu
Review of applications begins on February 1, 2022 and will continue until the position is filled.

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NC STATE UNIVERSITY

Department of Statistics

Tenure-Track Faculty Positions

The Department of Statistics at North Carolina State University in Raleigh, North Carolina seeks to hire multiple tenured/tenure-track faculty. All ranks will be considered. The start date is August 2022.

Applicants with interests and expertise in theoretical or methodological research in any area of statistics or biostatistics will be considered. Candidates with interests in data science, machine learning, and modern methods of data analysis more generally are encouraged to apply. The ability and desire to supervise graduate student research and to pursue excellence in teaching are essential.

To apply, please visit: *https://jobs.ncsu.edu/postings/146782*

The Department provides a dynamic environment for teaching, research and collaborations across disciplines. Inclusiveness and diversity are academic imperatives and are university goals: You will be expected to foster an environment that is supportive and welcoming of all groups. We are interested in candidates who have experience working with students from diverse backgrounds and have a demonstrated commitment to improving access to higher education for students from underrepresented groups.

The Department's location in the Research Triangle provides rich opportunities for interactions with industry; other universities, including Duke University and the University of North Carolina at Chapel Hill; and government agencies. Faculty enjoy collaborations with medical researchers at Duke, environmental scientists at the EPA research facility, pharmaceutical researchers at Glaxo-SmithKline, and software developers at SAS Institute, among many others.

All applicants must have a Ph.D. in Statistics or Biostatistics or a related field by the time of employment. Review of applications will begin soon and will continue until the positions are filled. Questions about the search may be directed to the Search Committee Chair: *stat_search@stat.ncsu.edu*.

NC State University is an equal opportunity and affirmative action employer. Women and members of other underrepresented groups are encouraged to apply. In addition, NC State University welcomes all persons without regard to sexual orientation or genetic information.

COLUMBIA UNIVERSITY DEPARTMENT OF STATISTICS

Assistant Professor (Tenure Track) Starting Fall 2022

POSITION DESCRIPTION: The Department of Statistics invites applications for a tenure-track Assistant Professor position to begin July 1, 2022. A Ph.D. in statistics or a related field by the date of appointment is required. Candidates will be expected to sustain an active research and publication agenda and to teach in the departmental undergraduate and graduate programs. The field of research is open to any area of statistics and probability.

The Department currently consists of 30 faculty members, 59 PhD students, and over 300 MA students. The Department has been expanding rapidly and, like the University itself, is an extraordinarily vibrant academic community. We are especially interested in candidates who through their research, teaching and/or service will contribute to the diversity and excellence of the academic community. Women and minorities are especially encouraged to apply. For further information about the Department and our programs, please go to our webpage at: http://www.stat.columbia.edu

QUALIFICATIONS: Ph.D. in statistics or a related field by the date of appointment, as is a commitment to high quality research and teaching in statistics and/or probability.

Application Instructions: All applications must be submitted through Columbia's online Academic Search and Recruiting portal (ASR) apply.interfolio.com/93721

The application must include a cover letter, curriculum vitae, statement of teaching philosophy, research statement, and the names of 3 references, who will be asked to upload letters of recommendation.

Inquiries may be made to Dood Kalicharan at dk@stat.columbia.edu

Review of applications begins on November 29, 2021, and will continue until the position is filled.

Equal Employment Opportunity Statement
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Columbia University Department of Statistics

Distinguished Postdoctoral Fellow in Statistics Starting Fall 2022

POSITION DESCRIPTION: The Department of Statistics invites applications for the 2022 Distinguished Postdoctoral Fellowship in Statistics at Columbia University. This fellowship seeks to bring exceptional scientists of outstanding potential to Columbia University. This two-year fellowship, with no teaching obligations, is to begin between July and September 2022. The Fellow will hold the rank of postdoctoral research scientist in the Department of Statistics. A competitive annual salary will be supplemented with generous funding for conference travel and research support.

APPLICATIONS IN ALL AREAS OF STATISTICS AND PROBABILITY WILL BE CONSIDERED: the primary selection criterion will be the candidates' exceptional promise to produce high quality and visible research. Candidates must have a PhD in statistics or related field by the date of appointment. Fellows will be expected to pursue a vigorous research agenda and to participate actively in the intellectual life of the Department.

The Department currently consists of 30 faculty members and 59 PhD students. The department has been expanding rapidly and, like the University itself, is an extraordinarily vibrant academic community. We are especially interested in candidates who, through their research, teaching and/or service, will contribute to the diversity and excellence of the academic community. Women and minorities are especially encouraged to apply. 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

QUALIFICATIONS: PhD in statistics or related field by the date of appointment

APPLICATION INSTRUCTIONS: All applications must be submitted through Columbia's online Academic Search and Recruiting portal (ASR) apply.interfolio.com/94215. The application must include the following:

- A cover letter that explains your motivation for applying for this position and indicates your choice of mentors from the statistics faculty.
- A curriculum vitae (including a list of publications)
- A brief research statement that summarizes current research interests, past accomplishments, and future research goals. It should contain a short proposal for the research activities you plan to conduct while at Columbia.
- The names of 3 references—references will be asked to upload letters of recommendation in RAPS.

Review of applications begins on **January 13, 2022,** and will continue until the position is filled.

Inquiries may be made to Dood Kalicharan at dk@stat.columbia.edu.

Equal Employment Opportunity Statement
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an accredited institution. Please apply here: *https://statistics.wharton.upenn.edu/recruiting/facultypositions.* Applying by December 1 is encouraged for full consideration. Forward questions to *statistics.recruit@wharton.upenn.edu.* The University of Pennsylvania is an EOE. Minorities / Women / Individuals with disabilities / Protected Veterans are encouraged to apply.

Texas

■ The Department of Mathematical Sciences at The University of Texas at El Paso (UTEP) seeks a data scientist with expertise in statistical modeling of big data and/or high-performance data analytics, for a tenure-track Assistant Professor position. Successful candidates will develop research programs, mentor and teach undergraduate and graduate students. Experience in applied interdisciplinary research/industry is encouraged. To view the full ad and apply visit *www.utep.edu/employment.* UTEP is an Equal Opportunity Employer

The Department of Statistics and Data Sciences at The University of Texas at Austin invites applications for faculty positions to begin in Fall 2022. Qualifications include a PhD in statistics or related field with research interests in any area of statistical applications, theory, or methods. Details and application are available here: *https://apply.interfolio.com/94414.* EOE

West Virginia

■ The School of Mathematical and Data Sciences at West Virginia University invites applications for two tenure-track, benefits eligible, nine-month positions in Statistics at the rank of assistant professor starting August 2022. Application review will begin November 15, 2021. Please visit *http://jobs.wvu.edu* for more information and to apply. EOE. ■

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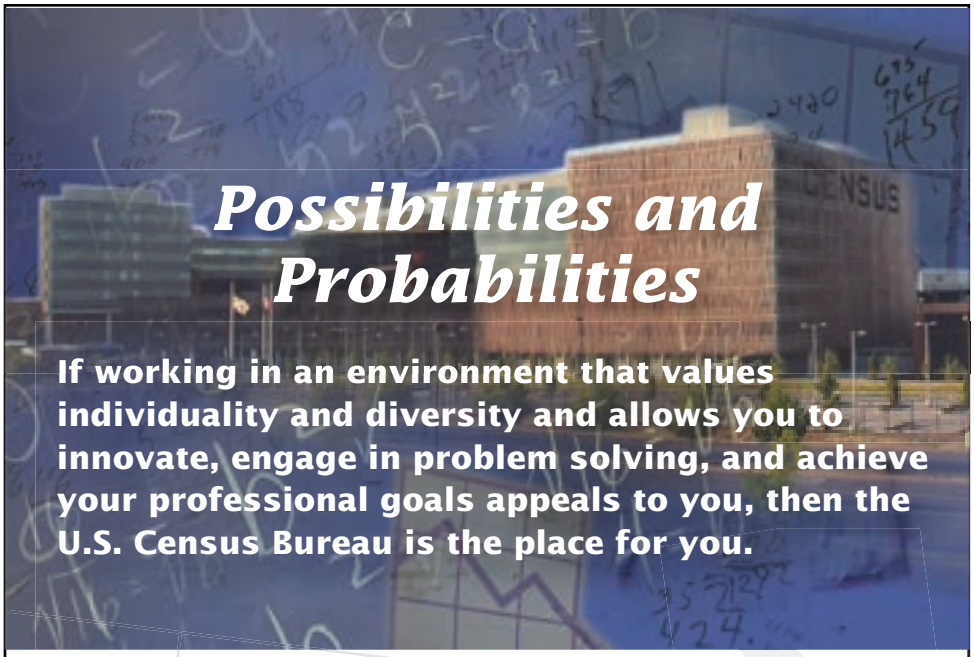

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Dancing with Dr Kildare, by Jane Yardley, is perhaps unique in that its heroine and its author are biostatisticians.

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Moneyball - Michael Lewis. This novel/movie kinda fits the bill. The main character employs computer generated statistics to build a low budget high impact baseball team.

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>
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Forty Signs of Rain has an NSF bioinformatician as the main character. Getting closer...

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Data Games by H.I. Weisberg, published quite recently!

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Toño Dávalos
The protagonist of Brainrack (1974, Pedler and Davis) is indeed a statistician.

Matt Albough
Fight Club is about an actuary.

Erin Blankenship
One of the main characters in the new Louise Penny mystery (The Madness of Crowds) is a statistics professor. But she's sort of evil.

Alice Richardson
Data Games by H.I. Weisberg, published quite recently!

John Moyer
Psychohistory is a fictional science in Isaac Asimov's Foundation universe which combines history, sociology, and mathematical statistics to make general predictions about the future behavior of very large groups of people, such as the Galactic Empire. It was first introduced in the four short stories (1942–1944) which would later be collected as the 1951 novel Foundation.

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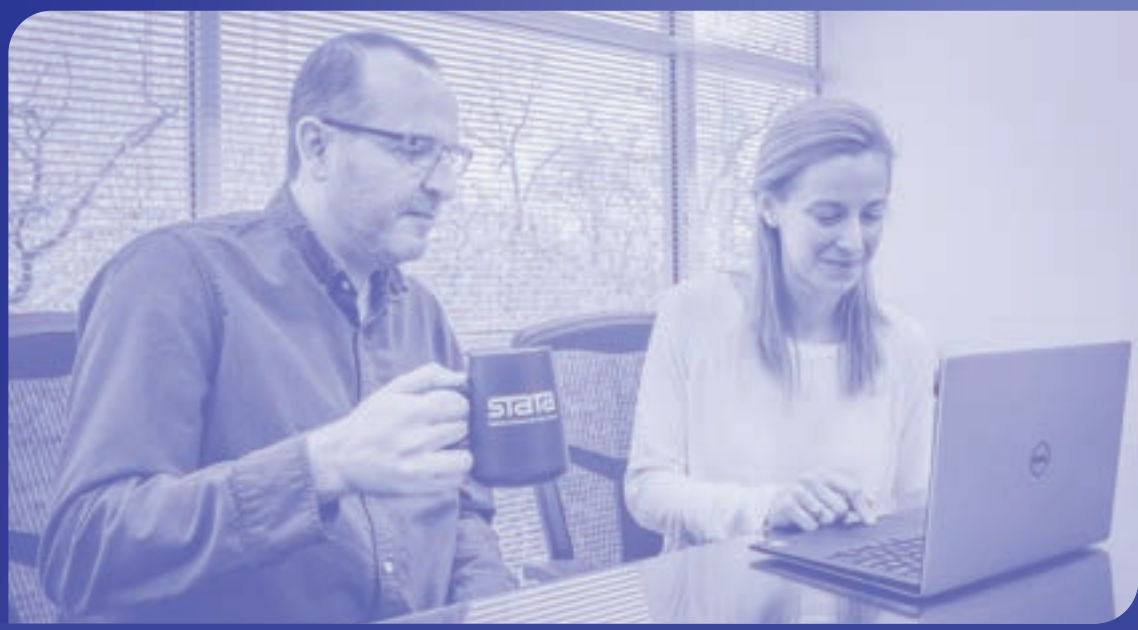

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