



BROWN

# SOCIAL DATA ANALYTICS

IN THIS ISSUE

## New Tools > New Possibilities

Using AI, social media and other  
new technologies to analyze social change





# Welcome to a Dynamic Field

**EMPLOYMENT OPPORTUNITIES IN THE FIELD OF DATA ANALYTICS** have never been better. The US Bureau of Labor Statistics predicts that employment in the fields of data science and market research will grow by 36% and 13%, respectively, over the next 10 years, far outpacing the predicted average for all occupations.\*

Colleges and universities in the US are responding to this growing demand with a rapid expansion of data analytics programs. In just three years—since 2020—the number of universities offering master’s degrees in data analytics grew from 15 to 49 and the number of students completing these degrees increased almost five-fold, from 344 to 1681, according to a recent cover story in *Amstat News*, the American Statistical Association magazine.”

Now about to enter its ninth year, our Master of Science in Social Data Analytics (MSDA) program at Brown remains at the forefront of this surge of interest in the field. Graduates of the program have successfully found employment that matches not only their skills and training but also their career and lifestyle aspirations. The strengths of our program are its small size, the close interaction between students and faculty, and exceptional course selections.

Recent new faculty hires in the Department of Sociology will further expand the range of courses in cutting-edge data analytics methods available to our students. In addition to assistant professors **Han Zhang** and **Ananda Martin-Caughey**—both of whom are introduced in this issue of *Social Data Analytics*—Assistant Professor **Michela Musto**, an expert in ethnography and qualitative methods, joined the department this year, and Assistant Professor **Courtney Boen**, a social demographer who uses administrative data to examine health inequality, will begin in the fall, joining us from the University of Pennsylvania.

Clearly, it’s an exciting time to enter the burgeoning field of data analytics. We welcome your questions about our program and/or suggestions for coverage of MSDA students, faculty, alumni, and programmatic developments in future issues of this newsletter.

**David P. Lindstrom** PhD  
Program Director / Professor of Sociology

**Carrie Spearin** PhD '07  
Associate Program Director / Senior Lecturer

## Big Data Yields Big Breakthroughs



**FOR HAN ZHANG**, an assistant professor set to join the Watson Institute and Sociology faculty this fall, rapid advances in AI continue to open up exciting new possibilities for social science research. But given the focus of his research—which centers on social movements, activism, public protest, and global surveillance—

he concedes that AI also has its downsides, especially in light of how large language models like ChatGPT may contribute to the resurgence of authoritarianism around the world.

“From the technology side I’m not too worried,” Zhang says of the AI revolution, speaking via Zoom during a holiday visit home to Wuwei, in China’s northwest Gansu province. “But as a political sociologist, I care deeply about how governments and regimes are doing things. So from my vantage point, I’m pretty worried about how AI actually empowers authoritarian governments and other power holders.”

In his teaching—most recently at the Hong Kong University of Science and Technology—Zhang has found that the advent

of chatbot technology is opening up new possibilities for students and changing the way he introduces them to innovative methods of social science research. Just over a decade ago, he had majored in both computer science and history as an undergrad at Peking University and had gotten involved in a cutting-edge research project at Harvard to collect historical data on social networks. That experience fueled his growing interest in sociology and happened to coincide with the rise in popularity of social networking platforms like Facebook (now Meta), Twitter (now X), and Weibo in China—and within a few years, Instagram and TikTok, too.

“Social scientists began to realize that we could use the big data from these social networking platforms to do research,” Zhang says, adding that it was “a golden age for young people like me to get attracted to using machine learning and big data” in new ways.

This led Zhang to Princeton for his PhD in Sociology, with several political science courses along the way. Having grown up in China, he became interested in exploring what motivates people to band together to protest and how various governments respond to this type of activism.

“The Chinese government had stopped sharing information about public protests just as they began to increase—around 2010 and 2011—and it seemed that the government was hiding this information for a reason,” Zhang explains. “But no one actually had any data or statistics, so I built a data set from Weibo and other social media platforms in China that documented people’s offline protests in various parts of the country.” As part

of the dissertation he completed in 2020, he collected a *lot* of data—roughly 10 million social media posts, a data set that remains of interest for further collaborative research.

“One of our big findings was that around 2013 or 2014 the number of protests in China actually began decreasing, which was not what people expected,” Zhang notes. The reason? Researchers suspect that it may have to do with the recent increase in the number of cameras in public spaces around the world. “Some people believe that this has its pros—as in reducing crime—and its cons: discouraging protests,” he explains. “I am investigating both possibilities.” (Among

“I want to look at surveillance broadly and historically—maybe going back to imperial dynasties in China or the Stasi in East Germany,” he says, “and look at the similarities with modern-day surveillance, some of which is performed by companies, some by governments.” Given that the more data is collected the better the algorithms behind today’s commercial and online interactions become, both public and private sector operatives have plenty of incentive to gather ever more information. “So there’s a positive feedback loop,” Zhang notes with a wry smile. “I want students to consider the social consequences of that and why we should worry about it and what some of the ethical takes are on that.”

Zhang also looks forward to teaching a course on social movements worldwide, comparing activism in China, the US, Russia, and elsewhere. Such courses give him an opportunity



**With GPT there’s an exciting opportunity because the demand on students is much reduced since they no longer need... training in programming first.**

the spinoffs from this research are Zhang’s recent papers titled *Underrepresentation and Misrepresentation: Selection and Description Bias in Protest Reporting by Government and News Media on Weibo* and *Authoritarian Responsiveness and Political Attitudes during Covid-19: Evidence from Weibo and a Survey Experiment*, with two other papers completed at the beginning of this year on how AI surveillance curtails collective action and the density of global surveillance cameras based on street-view images of 1,630 of the world’s most populous cities.)

Zhang’s ongoing interest in the ramifications of advances in technology will underpin one of the courses he’s excited to teach at Brown.

to combine his continuing interests in political science with the ever-evolving analytical methodologies he has developed as a social science researcher.

In addition, Zhang plans to fine tune the methodology course he teaches about how to use big data and machine learning (“AI stuff”) to do social research. “Previously, I was teaching the non-GPT version of machine learning to code a lot of text documents or image data to launch a project that might have millions of data points,” he explains. “But with GPT there’s an exciting opportunity because the demand on students is much reduced since they no longer need courses and training in programming first.”

For Zhang, that represents an enticing invitation once he’s at Brown to continue innovating at the intersection of AI and social science research—to “figure out different possibilities and incorporate them into my teaching.” ■

## CLASS OF '24

COHORT SIZE

# 10

AVERAGE AGE

# 24

COUNTRY OF ORIGIN

## China US

UNDERGRAD STUDY

- ▶ Brown University
- ▶ Chinese University of Hong Kong
- ▶ New York University
- ▶ University College London
- ▶ University of California–Davis
- ▶ University of California–Los Angeles
- ▶ University of California–Santa Cruz
- ▶ University of Connecticut
- ▶ University of South Florida

UNDERGRAD MAJOR

- ▶ Business/Management
- ▶ Economics
- ▶ Environmental Studies
- ▶ Psychology
- ▶ Social Analysis and Research
- ▶ Sociology
- ▶ Social Sciences
- ▶ Statistics



## Investigating Inequities in the Workplace



AS A NEW MEMBER OF THE SOCIOLOGY FACULTY, Assistant Professor **Ananda Martin-Caughey** relocated to Providence just weeks before classes began last fall—and just months after earning her PhD in Sociology from New York University, where her dissertation centered on new ways of analyzing occupation-related data for insights into inequality, organizational power structures and hierarchies, and stratification by race and gender.

Martin-Caughey says that her personal history drove her decision to delve deep into issues of racial and gender inequality in her graduate studies. “Being a white-passing woman of color (my mom is an immigrant from India) and growing up in a very racially diverse area of Maryland, I was always interested in the dynamics of race and gender in the workplace and the barriers people face when trying to find good jobs,” she says. After majoring in government and economics at Harvard, her passion for public policy led to work as a research assistant at the Urban Institute, a think tank in Washington, DC, where her projects focused on job training and job quality. In working with a number of sociologists there, she began to realize that the field of sociology really meshed with her interest in investigating inequality and its causes.

At NYU Martin-Caughey intensified her study of occupations as “really central for a sociological understanding of inequality.” In her last year there, she accepted a position as a survey statistician for the US Census Bureau while still working on her dissertation. By that point, she had come to recognize that the ways various governmental agencies typically survey and assess jobs is limited and unable to surface important nuances, which leaves social scientists and policymakers lacking a full picture of what’s actually happening in the labor market.

With that in mind, Martin-Caughey wanted to account for obvious variations in experience for people working in broad occupational categories such as ‘physicians and surgeons’ or ‘postsecondary teacher,’ which encompasses everyone from low-paid adjunct faculty members with little job security to fully tenured professors. “My innovation here was to look at the responses people in specific job categories actually give when they respond to surveys,” she explains.

Partnering with colleagues at the Census Bureau “who understand the importance of these questions,” Martin-Caughey was able to access the text data in certain surveys (that is, how people actually filled out the forms) and employ various text analysis metrics for discerning dissimilarity or heterogeneity in responses within job categories. “These are basically metrics that tell you how homogenous the responses are or whether they’re all over the place, with people saying very different things,” she explains. To get at the impact of race and gender, she also looked at whether segregation is happening within an occupation at the level of job titles and tasks.

“It turns out that on average there’s a lot of heterogeneity, but it differs depending on the occupation, with some that are very cohesive and others that are really varied,” Martin-Caughey says, adding that in terms of titles and tasks, “we found that there is substantial segregation and that hadn’t been quantified before.” Through ongoing research, she intends to look at how job title or task segregation is related to income and wages, the gender and racial pay gaps, and other markers of inequality within occupations. “One of the questions I still hope to explore is task segregation,” she says: “Are men and women or white versus people of color doing different types of tasks within the same job? What are the reasons for that and how widespread is it?”

Overall, Martin-Caughey says her research “sheds light on the fact that we need to be careful when we use traditional measures of occupation because of everything they might be hiding. That’s an important insight for researchers to understand if they’re working with occupation data.”

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Last fall, Martin-Caughey enjoyed getting acquainted with the Brown community by offering 46 undergraduate students from diverse majors a course on how people behave in organizational settings. “It was fun—and practical,” she says. “We thought a lot about the nonrational ways people behave based on the culture of an organization and their role within it, and how these things affect motivation and decision-making, power and exploitation.”

This spring, Martin-Caughey is excited to turn her teaching focus to grad students through a new MSDA and PhD course on gender, work, and inequality. “I really love teaching,” she says, “which is one reason I was so excited to come to Brown, where there’s such an emphasis on high-quality teaching. I have a lot of discretion here to teach what I’m interested in, and at the beginning of every course, I always survey students to find out what they’re most interested in, and where I can, I try to adapt the syllabus to address those interests. That’s encouraged here, which is good for me and good for students.”

### SELECTED MSDA COURSES

## ADVANCED ELECTIVES IN METHODOLOGY

- ▶ Focus Groups for Market and Social Research
- ▶ Context Research for Innovation
- ▶ Qualitative Methods
- ▶ Ethnography: Theory and Practice
- ▶ Geographical Analysis of Society
- ▶ Spatial Thinking in Social Science
- ▶ Event History Analysis
- ▶ Statistical Methods for Hierarchical and Panel Data
- ▶ Causal Analysis
- ▶ Computational Methods for Social Scientists
- ▶ Applications in Geographic Information Systems
- ▶ Comparative Historical Analysis

### COURSE HIGHLIGHT



## TECHNIQUES OF DEMOGRAPHIC ANALYSIS

Among the most highly valued courses that MSDA students take is *Techniques of Demographic Analysis*, which also fulfills a requirement for the doctoral training in demography offered by Brown’s Population Studies and Training Center (PSTC). Funded by the National Institutes of Health, the National Science Foundation and private foundations, the PSTC supports collaborative, multidisciplinary teams of researchers—anthropologists, economists, political scientists, sociologists, epidemiologists, and other public health professionals—working together to address global population issues ranging from health and educational disparities to migration, drug addiction, dementia, the climate crisis, and more. MSDA students not only have access to courses taught through the center but also value its topical colloquia and popular professionalization workshops.

**Students learn how to use the methodology Qian teaches to analyze empirical data throughout the social sciences.**

In the course, Professor **Zhenchao Qian**, an expert on social demography and family structure, introduces students to the methods and models used to study patterns and changes in population and covers basic demographic measures of fertility, nuptiality, mortality, and migration. A core textbook and weekly readings and discussions support the work students do to solve a series of problem sets both independently and collaboratively. “I believe that cooperation is the basis of good learning,” Qian tells students, “so I encourage you to work together.”

A research project and final presentation on any population-related topic give students an opportunity to apply the demographic concepts and methods introduced in the course. Projects may focus on anything from aging to the environment to Qian’s own areas of expertise, including interracial marriages, partnering based on education level, inequality and stratification as they relate to family social status—or whatever a student finds most compelling.

Overall, students come away from the course understanding how demographic techniques and statistical methods can be applied to related health, social, and economic issues, and how to use this methodology more broadly to analyze empirical data throughout the social sciences.

### Connecting Outside of Class



Special events throughout the year bring Brown’s Sociology community together. These include (from top to bottom) a virtual gathering at which alumni speak to students about their careers, an annual grad student orientation, and a holiday party for all Sociology majors.

left: shutterstock.com | above left: photo courtesy of Ananda Martin-Caughey | right: images courtesy of MSDA Program | above right: iStockphoto.com



## Embracing Uncertainty

**THE REALIZATION THAT CHANGE** is the only constant in life didn't really begin to hit **Yunjing (Fiona) Zhang** ScM '22 until several years ago when she was finishing up her undergraduate degree at Pennsylvania State University. As a communications major, she had asked a number of professionals in the field what they considered the biggest change or trend in the industry she hoped to enter. Every single one of them cited data and the recent surge in data analytics as transformative and increasingly essential to people working in marketing, public relations, and communications.

"I suddenly realized that public relations and communications are not only about qualitative issues involving reading and writing," Zhang says. "They're also about quantitative stuff."

Once that became clear, Zhang realized that the solid but very traditional program at Penn hadn't fully prepared her for the many changes impacting the communications industry. As an international student who had come to the US from Xian, China in 2017, she was also concerned about her job prospects after graduation but wanted to stay on in America. "So I applied to Brown's program because Social Analytics and Research (as it was called at the time) seemed like a perfect fit for me," she says. "It was a true aha-moment for me when I realized that Communications is really part of Sociology"—the study of how humans behave, interact and communicate as a society.

At Brown, Zhang initially found it challenging to shift from her undergrad emphasis on the literary arts to focus instead on the mathematical mindset needed to understand statistics, specialized software, and programming. But given the noncompetitive nature of the program, she adjusted relatively easily.

"One thing that's special about what I experienced at Brown," Zhang says, "is that because the cohort is so small and there's not just one professor per 100 students, all of them were very available and supportive. For instance, I had David [**Professor Lindstrom**] for statistics and he made it really easy for me to go to him with any questions during office hours. He was always there for me. The level of support I received from my classmates and my professors was just great. And one thing I remember so clearly is that although I was not a top-grade student, there wasn't a moment when I was made to feel like I was a bad student or hopeless. The environment supported me



**Although I was not a top-grade student, there wasn't a moment when I was made to feel like I was a bad student or hopeless. The environment supported me to keep learning, without feeling ashamed or insecure about anything.**

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Now a senior analyst at the communications firm Weber Shandwick in Washington, DC—where she interned throughout her year at Brown—Zhang continues to soak up new knowledge as she focuses on topic modeling, social trends, social performances, social listening, and qualitative and quantitative analysis for various clients. She recognizes that while the "thoughtful and thorough" methods and "meticulous approach" to problem solving she learned at Brown are applicable in a professional environment, the demands of meeting client expectations often call for significantly different approaches along with exacting attention to details.

As Zhang waits on the "chance game" of the H1B lottery, which will determine whether

or not she can continue working in the US after her student visa expires, she remains confident about her future. "No matter where I end up, all the things I learned at Brown are transferable. That's really one of the biggest strengths of the program. It's not only about the knowledge, it's also the methodological rigor, self-reflection, and problem solving I learned, which continue to serve me daily."

Although Zhang is hesitant to plan for the future—with her unpredictable visa status and "AI rising and everything being so different every year"—she believes "uncertainty is OK." That said, she pauses, and adds: "I don't know what industry I'll be working in or what kind of work I'll be doing in five or 10 years, but I may be starting my own business, trying out a new idea or a new way of doing things. I think anything is possible." ■

above left: photo courtesy of Yunjing Zhang | above right: photo courtesy of Yue Peng | next page: iStockphoto.com

## From Data Miner to Data Steward

**AN AVID LEARNER**, **Yue (Lina) Peng** ScM '22 has always been able to pick up new concepts and subjects quickly and pursue diverse passions on her own. Her eclectic interests extend from anime and art-making to human behavior and organizational theory, and as a teenager the native of Shenzhen, China taught herself Japanese—and became fluent in it in college—simply based on her childhood love of Pokémon and other anime series.

When Peng came to Brown as a graduate student, it was after she had started out in marketing, working for a couple of years at the Massachusetts-based telecommunications firm iBASIS. There she was able to merge some of what she had learned in earning a BS in business from Skidmore with the graphic design skills she had picked up through a minor in studio art. But given her parents' clear expectations that she would continue her education at the graduate level, she chose to pursue the interest in organizational strategy and behavior that had surfaced during her undergraduate years and perhaps follow a PhD path to a career in academia.

Although she also got accepted at the University of Chicago, Peng opted for the more intimate MSDA program at Brown. "Online, people complained about the program in Chicago pushing students to be very competitive," she says, adding that given the excellent student/faculty ratio at Brown, "I knew I would get more personal attention from professors."

That expectation proved to be very true, yet Peng wasn't fully prepared for just how fast-paced the learning experience would be. "Since it's a one-year program, you really have to learn a lot in a short timeframe," she says. "I also chose programming classes without having much previous knowledge and spent a lot of time learning about new technology that I didn't even know existed."

As part of the program, Peng was pleased to pursue her interest in strategic innovations through a research project on entrepreneurship with Professor **Mark Suchman**. "It was really eye-opening because it was a very new topic," she says. "We got to learn a lot of new techniques—based on different clustering algorithms and Python—and he gave me a lot of suggestions on how to do research and write a research paper."

After an intense year of concentrated learning, Peng initially hoped to find a good college or university research assistantship. But she quickly expanded her search to the private sector, where she landed a position as a senior associate and domain expert at Dataminr, working remotely from San Diego—a city that promised sunshine and warmth, which are much more aligned with her personal preferences than Providence's weather.

As it turns out, Peng discovered that working at Dataminr was "very intense" since the company uses real-time AI and public data generated on social media to create alerts about "high-impact events and emerging risks" for global corporations, public sector agencies, newsrooms, and NGOs. Though she tapped into much of what she had learned in the course *Computational Methods for Social Scientists* and was given more responsibility thanks to her experience at Brown, she was uncomfortable with "the constant exposure to disturbing content."

So Peng searched for a less stressful job—one where she could essentially "sip coffee and make presentations," she says with a smile. In December she was pleased to begin a new position at Sony with the title of Data Steward, responsible for streamlining and modifying the process of data sharing between various Sony divisions or companies within the larger organization. And she readily credits the



**The program is very conceptual but is also about problem solving and learning to analyze things at a very high level.**

skills she learned in the MSDA program with helping her to land the new position at Sony.

"I think the most important thing I learned was the analytic skills and the ability to look at a problem holistically, which Sony and other employers appreciate," Peng says. "The program is very conceptual but is also about problem solving and learning to analyze things at a very high level. It honestly broadened my view of everything."

As for her original idea about possibly continuing on for a PhD, Peng is no longer so sure about that and isn't in a hurry to decide one way or the other. "I've been learning a lot on the job," she says, "so I want to explore more about how the industry is going before diving back into academia again. Maybe I'll do that someday, but Brown taught me curiosity and critical thinking, so I want to keep using those concepts in the wider world." ■

## MARKETPLACE Alumni at Work

MSDA graduates contribute to a wide range of fields, from education and other nonprofit areas to entertainment, finance, marketing, technology, and more. Alumni are currently working at:

- ADMERASIA
- American Express
- American Institutes of Research
- Bento
- BioCentury, Inc.
- CharterUP
- DataReady DFW
- Enterprise Community Partners
- Entertainment + Culture Advisors (ECA)
- EQ.app
- Fastmarkets Metals and Mining
- GAC Motor
- HBO Max
- International Monetary Fund
- JOOR
- Keybridge Public Policy Economics
- Link Logistics
- Lenovo
- LMDK Agency
- Marketade
- MetrixLab
- Microsoft
- NewGlobe
- Sony
- The Brattle Group
- UBS Shanghai
- Weber Shandwick
- Yale University



# PROGRAM HIGHLIGHTS



BROWN

Department of Sociology

## WHY CHOOSE THE SOCIAL DATA ANALYTICS PROGRAM AT BROWN?

*Among the advantages of our one-year master's program:*

- ▶ We offer more than 25 **quantitative, qualitative** and **mixed-methods courses**
- ▶ Courses are taught by **world-renowned, research-active faculty**
- ▶ Our one-year ScM is **STEM designated**
- ▶ Our **small program size** guarantees a high level of faculty/student interaction and advising
- ▶ We **emphasize data collection, analysis** and **interpretation**
- ▶ Students are encouraged to **participate in faculty research projects** and **professional internships**

[brown.edu/sociology](http://brown.edu/sociology)



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SOCIAL DATA ANALYTICS

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