Spring in Statistics

UC Riverside Department of Statistics Newsletter, Spring 2024

In this issue:

"Thanks for a great year! It's been our pleasure to serve as your GSA board this year and to the new board members: welcome to the team"

- 2023-2024 Statistics GSA

Photograph courtesy of Jericho Lawson

Faculty Spotlight

Dr. Weixin Yao

Where did you receive your graduate degree?
I obtained my PhD degree in statistics from the Pennsylvania State University (PSU) in 2007, under the supervision of Dr. Bruce Lindsay and Dr. Runze Li.

Did you work anywhere before UCR? If so, where and what did you do there?

I had the privilege of serving as an Assistant Professor at Kansas State University from 2007 to 2013, and subsequently as an Associate Professor with tenure until 2014. During my time there, I cherished the opportunities to engage with students and colleagues, contributing to the vibrant academic community at KSU. One particularly fond memory involves a heartwarming gesture from graduate students: they presented me with a unique gift—a pumpkin adorned with my likeness. This thoughtful gesture not only showcased their creativity but also underscored the strong sense of camaraderie within the department. It was a reminder of the rewarding relationships forged during my tenure at Kansas State University (See the photo to the right). The pumpkin featuring my likeness garnered an overwhelming majority of votes, making it the clear favorite among the options.)

What kind of research have you done? How can your research be applied to other data sets?
My research primarily revolves around advanced statistical methodologies tailored for handling complex data structures commonly encountered across various disciplines. Specifically, I specialize in mixture models, nonparametric and semiparametric statistical learning, robust data analysis, and high-dimensional data analysis. A recent focus of mine has been the development of 'modal regression.' These methodologies are particularly applicable to datasets exhibiting abnormalities such as skewness or heavy tails, as well as heterogeneity, which are prevalent in diverse fields including economics, social sciences, marketing, medical studies, public health, biology, engineering, and agriculture.

An illustrative example of the practical implications of my research is our recent work on nonlinear modal regression for predicting COVID-19 outcomes. Published in JRSSA, this novel approach outperformed traditional mean and quantile regression methods, demonstrating its efficacy in forecasting pandemic-related trends. By applying such innovative methodologies, my research aims to contribute valuable insights and solutions to a wide array of real-world challenges.

How did your interest in statistics begin?

My journey into statistics began unexpectedly during my college years. Although I initially pursued mathematics as my major, my academic advisor steered me towards the statistics department. At first, I was uncertain and perhaps a bit hesitant, as I had limited knowledge of the field. However, as I delved deeper into statistical methods, I found myself captivated by their capacity to unveil insights from complex data and guide decision-making processes. This initial intrigue soon transformed into a genuine passion as I began to grasp the profound impact statistics could have in addressing real-world challenges and advancing scientific understanding. Since then, my trajectory in statistics has been characterized by a curiosity to explore its theoretical underpinnings and innovate practical methodologies to tackle contemporary issues. This journey has been deeply rewarding, fueling my commitment to contribute meaningfully to the field and its applications.Today, I find myself in my dream profession, where teaching and research intersect to further deepen my engagement with statistics and its vast potential in the era of big data and AI.

What advice would you give to graduate students?

My first advice to graduate students would be to embrace curiosity and persistence. Research often involves navigating through uncertainties and setbacks, but maintaining a sense of curiosity about your subject matter can fuel your motivation to overcome challenges. Additionally, persistence is key; progress in academia often comes in incremental steps, so it's important to stay committed and positive even when the path forward seems daunting and even when you have thought about quitting many times. Secondly, I encourage students to actively network with their peers and participate in departmental events. Building relationships with fellow students not only fosters a sense of community but also opens doors to potential collaborations and opportunities for intellectual exchange. In addition, your fellow students will also be your valuable networking resources for your future career endeavors. Similarly, engaging/volunteering in departmental seminars, events, and social gatherings can provide valuable insights, broaden your perspective, and enrich your academic experience. Lastly, don't hesitate to seek guidance and mentorship from faculty members and senior researchers. Their expertise and support can offer invaluable guidance as you navigate the challenges of graduate studies and embark on your research journey.

What hobbies have you recently picked up?

I am color-blind and I didn't know that until middle school when I failed a color blind test. In high school, my academic advisor suggested that I should choose liberal arts rather than STEM majors in college, since it won't be safe/appropriate for me to pursue careers in medicine, engineering, or chemistry due to my color blindness. They even quipped that if I ever found myself in a bomb disposal situation, I'd better hope there's not a "cut the red wire" moment! Despite this initial setback, I persevered and ultimately found my passion in statistics (a STEM major!!!), a field where color perception is not a prerequisite for success.

Life Beyond UCR:

PoYao Niu

What did you learn as a graduate student that you use in your current work?
A lot of things! Since I work in the pharmaceutical industry, time series models, missing value imputation, non-parametric methods and multi-testing procedures are commonly used. The research experience is helpful as well because my job involves authoring statistical plans for drug development.

SAS and R programming are very important skills, too. Anything you learned could be useful!

What is your fondest memory of UCR?
I really miss the time I spent with friends at the Recreation Center—the large, clean basketball courts, the badminton courts on the second floor, and the swimming pools along with the warm spa pool, perfect for any season.

One of my most unforgettable memories is having lunch with colleagues on the shaded grass under the California spring sunshine

What advice would you give to the current graduate students?
Keep an eye on the job market. Start thinking about your career and focus on the skills you need. Choose classes and research topics that inspire you the most. Last but not least, enjoy the SRC and your spare time with colleagues.

What would you do differently if you were to start graduate school now?
It's a tough question since I enjoyed my life as a graduate student at UCR, haha. I wish I could have finished my research earlier, but you know... sometimes you just can't!

How did you determine your career path after graduating?
This is why I recommend students keep an eye on the job market and look for topics that inspire them while still in school. You can prepare and narrow down the options before you graduate.

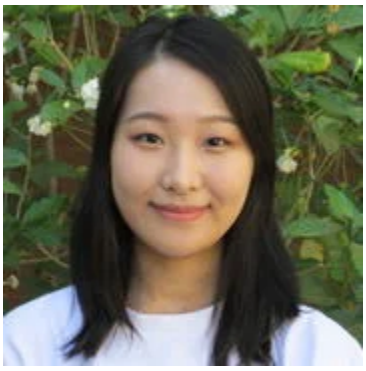
One thing I would suggest is to try different fields instead of limiting yourself to only one path. Sometimes you don't really know your strength in the industry until you start interviewing. Spending some time exploring the job market before you dive in. Once you feel more comfortable in some interviews than others, you'll know where you belong.

Graduating Students

We would like to highlight the graduating students from the Statistics Department in the 2023-24 school year. Congratulations to you all!

Ph.D Students

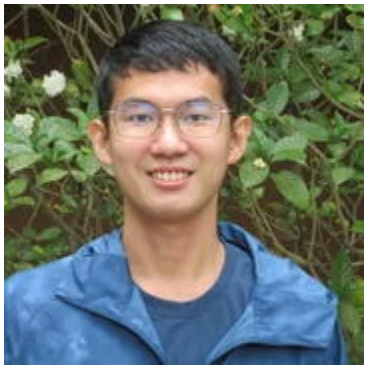
Queen Ikhelowa



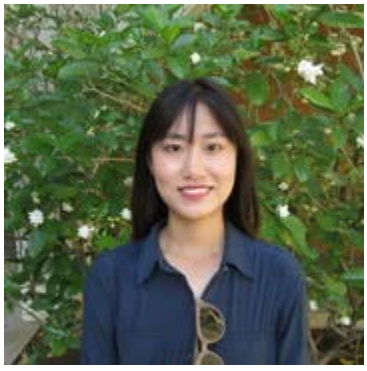
Rui Ma

Sichen Chen

Master's Students



Chin-Shen Teng



Ruijing Liu

Mu Sigma Rho

In Spring 2024, Mu Sigma Rho at UCR inducted 11 new members majoring in various disciplines such as Statistics, Mathematics, and Computer Science. Congratulations to the new members!

Jazmyne Patlan

Sarah Jiang

Liam Daly

Jonathan Darius

Connor Godoy

Kush Momaya

Eve (Eden) Fraczkiewicz

Malachi Ambra

Tiffany Peng

Nancy Lopez

Cameron Fong

Mu Sigma Rho (μσρ) is the US national statistics honor society. It seeks to promote and encourage scholarly activity in statistics and to recognize outstanding achievement among students and faculty in eligible academic and nonacademic institutions.

It aims to do the following:

- Electing members according to their academic achievement, especially in the field of statistics.
- Engaging in activities designed to promote the statistical and general scholarly development of its members.
- Encouraging participation in the various professional statistical societies and associations. We are always looking for leaders and planning activities.

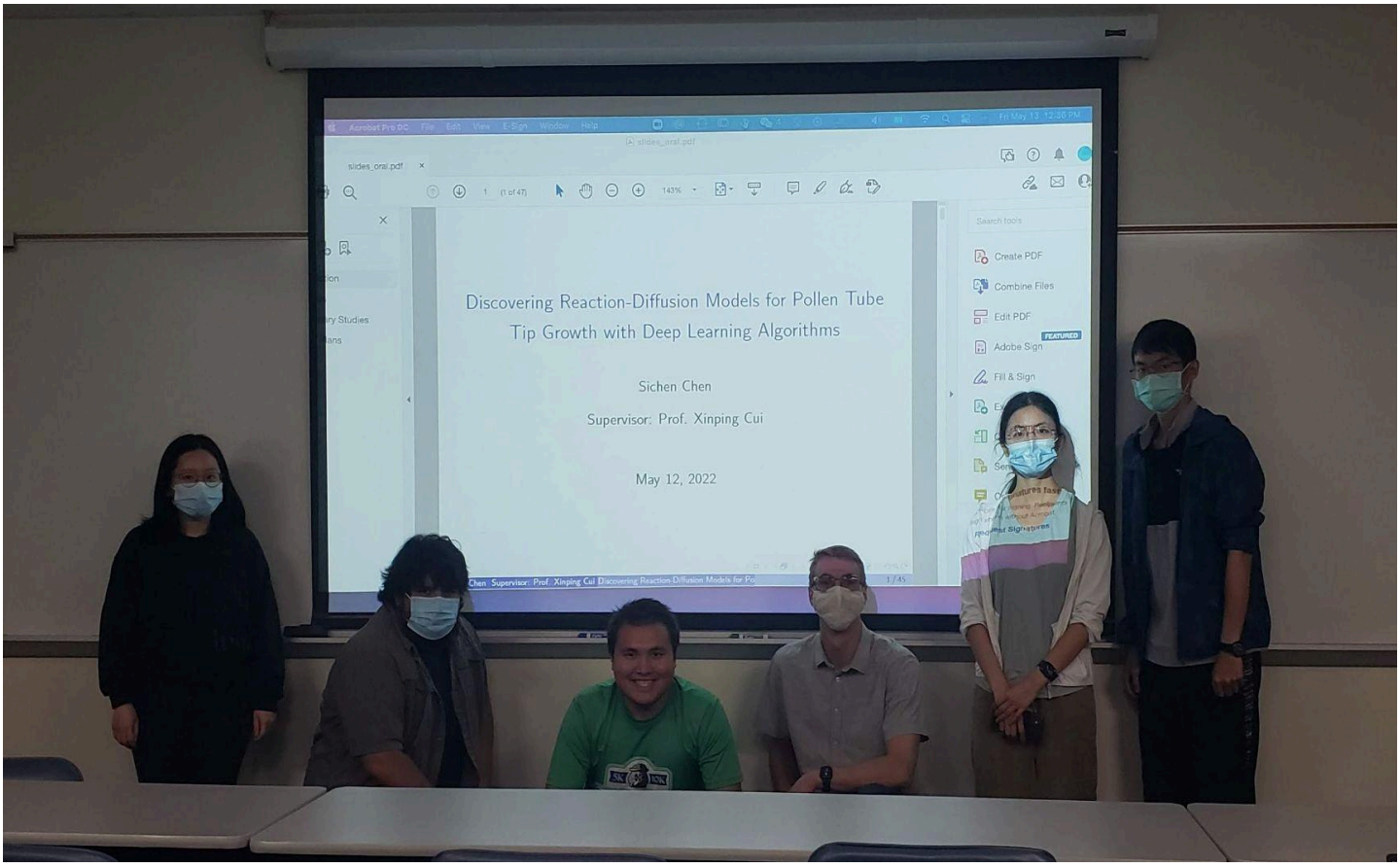
Special thanks to the 2023-2024 board members!

- President: **Emily Ouyang**
- Vice-President: **Trisha Agrawal**
- Treasurer/Secretary: **Jericho Lawson**

Graduate Student Seminar

A Seminar for Graduate Students

The GSS series is an opportunity for graduate students in our department to showcase some of the cool things they are doing, gain presentation practice, and get to know each other. The presentations can be on a variety of topics, including research, projects, internships, a topic you want to investigate, a paper that you found interesting, and more. Anything that is appropriate for the graduate-student level audience that could be of interest to the graduate students of this department is welcomed. The GSS welcomes, and **ENCOURAGES**, anyone who is interested to attend. This includes undergraduates, faculty, and staff. This is open to **ALL** graduate students.



We are always looking for speakers to present a talk. Whether it involves research, class projects, tutorials, or other ideas, we would love to have you present!

If interested, please email ucr.grad.stat@gmail.com with your plans for a talk!

GSA Year Overview

Graduate Student Seminars

Fall 2023

Treatment Effects Estimation with Unmeasured Confounding Variables - Namhwa Lee

One of the primary objectives in causal inference is estimating the treatment effect. Average treatment effects (ATE) and conditional average treatment effects (CATE) are estimated based on a set of assumptions: Consistency, Positivity, and No unmeasured confounders. No unmeasured confounders assumption posits that potential outcomes become conditionally independent of treatment assignments when observed confounders are taken into account. However, this assumption presupposes the absence of unmeasured confounders, which is often unrealistic and susceptible to violations.

This paper is centered around relaxing the no unmeasured confounders assumption by accommodating an unmeasured effect within the postulated model. To this end, we introduce a novel method for estimating model parameters using the Laplacian-Variant EM algorithm. By illustrating the estimation result through numerical studies, we subsequently apply our proposed approach to a real-world scenario involving the impact of short-term air pollution exposure on mental health. This application is drawn from the CitieS-Health Barcelona Panel Study.

Spring 2024

Latent Dirichlet Allocation - Brian Tran

We describe latent Dirichlet allocation (LDA), a generative probabilistic model for collections of discrete data such as text corpora. LDA is a three-level hierarchical Bayesian model, in which each item of a collection is modeled as a finite mixture over an underlying set of topics. Each topic is, in turn, modeled as an infinite mixture over an underlying set of topic probabilities. In the context of text modeling, the topic probabilities provide an explicit representation of a document. We present efficient approximate inference techniques based on variational methods and an EM algorithm for empirical Bayes parameter estimation. We report results in document modeling, text classification, and collaborative filtering, comparing a mixture of unigrams models and the probabilistic LSI model.

Events

Halloween Paintings
Friendsgiving

Coffee Hours (5)
Pi Day

Botanical Garden Hike
End-of-the-Year BBQ

Summer Plans

What fun/interesting plans do you have for the summer?

- Evan Mason: Lucidity Festival
- Jericho Lawson: Various travel plans towards the end of summer, including Vancouver and Mexico City.
- Chin-Sheng Teng: May plan to go to the Dodgers game to see Shohei Ohtani!
- Gardner Eager: I shall be going to New Orleans
- Fangyi Cao: Checking out New Orleans

What's one place you recommend checking out in Riverside?

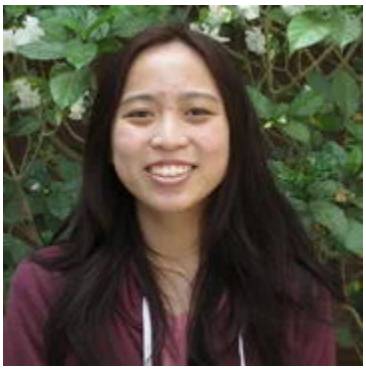
- Evan: Basketball at Andulka Park, everyone is quite nice
- Jericho: Sycamore Highlands Park – awesome views of Riverside and a great place to watch the sunset!
- Chin-Sheng: Mt. Rubidoux is the place I would recommend when my friends come to Riverside.
- Gardner: I saw a cool bird once that was neat
- Fangyi: I recommend Irvine

What new statistical theorem/topic/procedure/idea have you discovered over the last month in your research or classes?

- Evan: The Wishart Distribution in nonparametric estimators
- Jericho: Variational autoencoders in deep learning
- Chin-Sheng: We can use the cross-validation for the likelihood function to evaluate the model performance (STAT 217)
- Gardner: Controlling Type I error in Inference of Hierarchical Clustering
- Fangyi: Finding some ways to deal with astronomical image data

What to Expect Next Year...

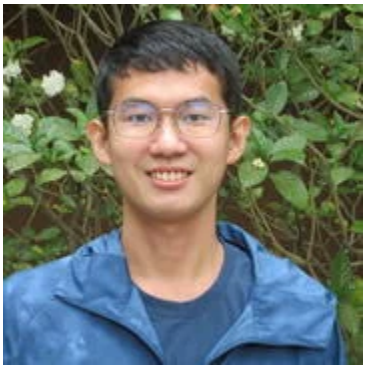
GSA Board



Emily Ouyang
President

Fangyi Cao
Vice President

John Eager
Treasurer



Chin-Sheng Teng
Secretary

Shiwei Fu
GSS Officer

Jericho Lawson
Events Officer

If you are interested in joining the team, please reach out! We are always looking for leaders! :)

List of Graduate Courses

Fall 2024

Course	Name	Instructor
201A	Theory of Probability and Statistics	Chen, Yuzhou
202A	Regression, ANOVA, and Design	Ghosh, Subir
206	Statistical Computing	Landeros, Alfonso
210A	Advanced Statistical Computing	Li, Yehua
218	Survival Analysis	Li, Wei Vivian
251	Statistics Colloquium	TBD
255	Seminar On Topics in Applied Statistics	Kurum, Esra
293	Methods in Applied Statistics	Sánchez Gómez, José

Winter 2025

Course	Name	Instructor
201B	Theory of Probability and Statistics	Ma, Shujie
202B	Regression, ANOVA, and Design	Ghosh, Subir
208	Statistical Data Mining Methods	Li, Wei Vivian
210B	Advanced Statistical Computing	Zhou, Shuheng
251	Statistics Colloquium	TBD
255	Seminar On Topics in Applied Statistics	Chen, Yuzhou
288	Literature Seminar	Zhou, Shuheng
293	Methods in Applied Statistics	Kurum, Esra

Spring 2025

Course	Name	Instructor
201C	Theory of Probability and Statistics	Ma, Shujie
202C	Regression, ANOVA, and Design	Ghosh, Subir
205	Discrete Data Analysis	Li, Jun
207	Statistical Computing	Fei, Zhe
209	Software Tools For Big Data Analysis	Liu, Xiaoqian
251	Statistics Colloquium	TBD

***Note**: These times and assignments are tentative and subject to change.

Important Dates

Event	Dates
Registration Window (for Continuing Students)	May 20 - Oct. 11, 2024
Registration Window (for New Students)	Jun. 1 - Oct. 11, 2024
First Day of Fall Quarter	Sep. 23, 2024
First Day of Fall Instruction	Sep. 26, 2024
Academic and Administrative Holidays	Nov. 11, 2024 Nov. 28 - 29, 2024
Add/Drop Date Deadline	Oct. 11, 2024
Last Day to Add Course (without Dean Approval)	Oct. 18, 2024
Last Day to Withdraw from Course (no fee)	Oct. 18, 2024
Last Day to Change Grading Basis (no fee)	Oct. 18, 2024
Last Day to Withdraw from Course ($4 fee)	Nov. 18, 2024
Last Day of Instruction	Dec. 6, 2024
Finals Week	Dec. 7-13, 2024
First Day of Winter Quarter	Jan. 2, 2025
First Day of Winter Instruction	Jan. 6, 2025

Feedback?

If you have any feedback or suggestions you would like to make, please email ucr.grad.stat@gmail.com.