Fall in Statistics

UC Riverside Department of Statistics Newsletter, Fall 2023

In this issue:

"Statistics is the grammar of Science."

- Karl Pearson

Photograph courtesy of Jericho Lawson

UC RIVERSIDE UNIVERSITY OF CALIFORNIA

COLLEGE OF NATURAL AND AGRICULTURAL SCIENCES
DEPARTMENT OF STATISTICS
900 UNIVERSITY AVENUE
RIVERSIDE, CALIFORNIA 92521

Dear Faculty, Staff, Students and Alumni,

In the spirit of another holiday season, I write to you with immense delight to share some exciting developments in the department. We welcome new faculty and staff members while celebrating the recent academic achievements of our senior faculty and the ongoing growth of our programs.

Starting from July 1st, 2023, Prof. Alfonso Landeros and Prof. Jose Sanchez Gomez joined UCR as Assistant Professors of Statistics. The department currently has 17 faculty, among whom 9 are women, and 3 are underrepresented minorities, making Statistics perhaps the most gender balanced, ethnicity diverse department on campus. The faculty hold PhD's in Statistics, Biostatistics, Biomathematics, Computer Science, Electrical and Computer Engineering, and are diverse in research interests as well.

Prof. Landeros got his PhD in Biomathematics at UCLA. Drawing inspiration from mathematical optimization, computing, and applied mathematics in general, his research seeks to expand the reach of statistical methods to the scale of modern data sets in scientific applications that include cancer, immunology, and genomics. Prof. Landeros is a native Californian, and a musician for over 10 years as a tubist. He performed with various groups throughout the state, including the Pasadena City College Honor Band (3 Rose Parades) and the Santa Clara Vanguard Drum & Bugle Corps. As a member of the UCLA Marching Band, he had the opportunity to open for the Rolling Stones during the band's "50 & Counting" Tour.

			
Prof. Alfonso Landeros	**Prof. Jose Sanchez-Gomez**	**Luz Sandovan Manjarrez** Contract and Grants Analyst	**Andrew Mejia** Financial Services Analyst

Prof. Sanchez Gomez got his Ph.D. in Statistics from the University of North Carolina at Chapel Hill. He is interested in high-dimensional data modeling and inference. In particular, he has developed statistical methods for the detection of structure in large graphical models and the testing of variable relationship networks. In addition to this, he has participated in consulting projects with professionals from a variety of disciplines, such as marine science, public policy, information technology and journalism. As for his hobbies, he enjoys cooking and hiking. The department also welcomes our new Contract and Grants Analyst, Luz Sandovan Manjarrez, and our new Financial Services Analyst, Andrew Mejia. Welcome to all!

2023 UCR Faculty Recognition Reception. From left to right: VPAP & Prof. Jeske, Prof. Ma, S., Prof. Cui and Prof. Li, Y.

As we welcome new members of our statistics family, we also celebrate new academic achievements of our senior faculty. **The department is proud to announce that Prof. Xinping Cui and Prof. Shujie Ma were elected in 2023 as Fellow of the American Statistical Association (ASA),** the oldest and largest professional organization in Statistics. Prof. Cui's election as ASA Fellow was a recognition for her "*exceptional academic leadership, innovative methodological research in multiple testing, statistical genomics and bioinformatics, and excellence in collaborative research in agricultural and biological sciences.*" Prof. Cui was the chair of the department from 2015 to 2021, and both the Data Science program and the MSBA program were proposed during her tenure as Chair. Prof. Ma was elected for her *"outstanding contributions to methodological and theoretical development in non-parametric and semiparametric machine learning; for dedicated and exemplary service to the statistical editorial boards and to the profession."* Prof. Ma is currently serving on the editorial board on several top statistical journals, including the *Journal of the American Statistical Association* and *Journal of Business and Economics Statistics*. The current faculty of the department now include 5 Elected Fellows of the ASA, 2 Elected Fellows of the IMS (Institute of Mathematical Statistics) and 1 Elected Fellow of AAAS (American Association for the Advancement of Science). I am sure more of our faculty will soon join their leagues.

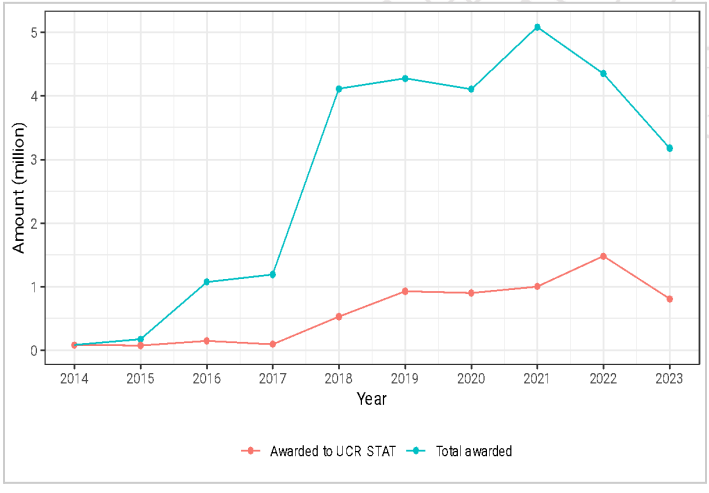
In addition to the two intercollege programs, the Data Science (DS) undergraduate program and the MS in Business Analytic (MSBA) program, the department is now a collaborative partner in the new Master in Public Health (MPH) program proposed by the Department of Social Medicine, Population, and Public Health (SMPP) within UCR School of Medicine. The program aims to build upon the existing strengths of UCR in teaching, research, and service in the core principles of public health and related fields, with the overarching goal to create a program that will serve the needs of Inland Southern California to train the next generation of public health leaders. Unlike the MSBA program, which is jointly administered by the School of Business and Statistics as partners, the MPH is fully administered by SMPP, and Statistics is serving as a

collaborator by providing 2 statistical courses. Prof. Kurum is chairing a committee, which includes Prof. Cui, Fei and Li, V., to propose the new course sequence STAT 233AB, Statistics for Public Health, which will be included in the 2024 course catalog.

Retreat dinner 2023: Cui, Lawson, Ouyang, Landeros, Ghosh, Flores, Alvarado, Munoz, Yao, Li, V., Fei, Li, J.

The Data Science program is now into its 4th year and the very first cohort of freshmen will be graduating. This joint venture between Computer Science & Engineering (CSE) and Statistics has become one of the fastest growing majors on campus. The DS admission AIS this year was the highest among all majors in CNAS and was the 2nd highest in BCOE only after Computer Science. There are 230 students currently claiming DS as their major (CNAS and BCOE combined). The program steering committee is proposing to continue growing this program, and a new DS minor has just been approved. Statistics and CSE also jointly secured several Data Science training grants, including a NSF DS-PATH grant (2021-2024, $1.2 million, Statistics Co-PI's Cui & Flores), a NSF Research Experience for Undergraduate students (REU) Site grant (2023-2026, $389k, Statistics Co-PI Fu), and a California Learning Lab grant on Greater LA Data Science Pathways (GLADS-PATH) (2023-2027, $1.28million, Statistics PI: Flores; Statistics Co-PI's: Li, J., Li, V. and Zhou). With the support of these grants, the DS faculty from both CSE and Statistics were able to launch multiple summer undergraduate fellowship programs that incorporate research, mentoring and training.

A new Actuarial Science (AS) major in SoB is launched in Fall 2023, and there are already 34 students claiming this major. By design, this degree requires 28 units of statistics, including STAT 08/10, STAT 107, STAT 146 as well as the STAT 160 A-C series. The students are also required to take two electives from STAT 161, STAT 167, STAT 170 and STAT 171. This major is posed to become another popular major in the School of Business. Many of the upper division courses included in either the DS or the AS majors will have their sizes tripled or quadrupled, driving further growth of the department.



This year, the department is undergoing an external graduate program review. The review period is from 2014 to present time. Looking back, one cannot help being amazed by the growth of the department. Back in 2014, we were a small department with only 8 senate faculty members and 3 lecturers. Ten of the 17 current faculty members were hired during this review period, and in fact 8 of them were hired during the past 5 years. Come with this growth, new programs and new courses have been developed, and our grant support has also drastically increased. In the figure on the left, we plot our annual grant expenditure from 2014 to 2023. The red curve illustrates the grant amount awarded to Statistics PI's. In the past 5 years, our grant expenditure was from 0.8 to 1.5 million dollars a year, which is a drastic increase from the previous years. Since Statistics faculty

often serve as Co-Investigator on grants, we also plot the total grants associated with our faculty (blue curve). In the past 5 years, our total grant impact was between 3.2 and 5.1 million dollars a year.

Another piece of good news that is worth sharing is that the AMSTAT NEWS, the official news magazine of the American Statistical Association, published a news piece spotlighting the JEDI (Justice, Equity, Diversity & Inclusion) achievements of our department in their December issue in 2022 (https://magazine.amstat.org/blog/2022/12/01/jedi2/). According to the National Center for Education Statistics, UCR graduated 27 Latino students (who are US citizens or permanent residents) with a BA in statistics for the period 2016-2020, and this number was more than any other statistics departments in the nation and represented 22% of our graduates for that period. Such an achievement was through decades of efforts from generations of faculty in the department and should be greatly celebrated!

Mission Inn in holiday decorations (picture taken on Nov. 14, 2023).

With the holidays fast approaching, and so much good news to share, I am extremely grateful for the contributions and sacrifices that our faculty and staff have made – the department is on an upward trajectory because of your tireless work and your strong will to make a difference. We are currently conducting searches for three faculty positions, and this is our third year in a row with multiple hires. We will continue to bring new talents on board and stride to build a world class statistics program that provides state-of-the-art curricula on modern statistics and data science, supports the diverse research, teaching and service needs of the UCR campus as well as the local communities, and conducts cutting-edge methodology, theoretical and interdisciplinary research with broad impacts on various scientific domains.

Faculty Spotlight

Alfonso Landeros

Where did you receive your graduate degree?

I received my PhD in Biomathematics from UCLA, under the Department of Computational Medicine (formerly Biomathematics).

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

Moving backwards in time from the present:

- I was a postdoctoral scholar at UCLA (~2 years) working on various constrained optimization problems with applications to statistical learning.
- Before that I was a GSR, like most other grad students, during the PhD student/candidate years.
- Before graduate school, I was a part-time programmer/analyst developing software for stochastic simulation of complex biological systems. The simulation code was written in FORTRAN (which was new to me at the time) and the simulations were called from a graphical user interface (GUI) written in Java (which I had learned in undergrad). Today, the whole project exists entirely in Julia and you can see some of that work here. While this project dealt mostly with stochastic processes as dynamical systems, it re-ignited my interest in probability through the lens of computing and ultimately sharpened my computational skills.
- In addition to programming, I worked as a marching band technician in the Torrance Unified School District (specifically West HS and South HS). As part of a team, I helped high school students learn how to move across a football field while playing an instrument -- in time, in phase, and in space. These students would compete with other schools across southern California (if not the country) on the weekends. Here is an example. Some of these students would go on to participate in elite groups that compete in the summer all across the country.

What kind of research have you done? How can your research be applied to other data sets?

Part of my research considers how to compute, for example, a statistic of interest or a solution to a least squares problem. Both a QR decomposition and the sweep operator can be used to solve a linear regression, but the latter can compute the solution in-place (without additional memory) and simultaneously recover variance estimates and residual sums of squares. So, while I often start by thinking about a faster way to compute a solution, a computational algorithm can reveal or inspire a new approach altogether. Another part of my research concerns the use of sparsity, rather than shrinkage, as a means to do variable selection. I

have investigated this approach empirically in various problems, such classification and regression, and am working towards developing techniques for recovering structured, sparse patterns.

How did your interest in statistics begin?

I started my undergraduate studies intent on studying applied mathematics. My first real exposure to statistics was in an undergraduate upper division course on probability theory which, regrettably, was also my first upper division class. Although I struggled through it, the class sparked my curiosity for the "language of uncertainty" and how it can be used to draw inferences or make decisions.

What advice would you give to graduate students?

I think it is good to spend a bit of time exploring a broad range of topics early in your graduate career, time permitting. That experience ought to give one a sense of what kinds of questions or problems are interesting. Ultimately, you must focus deeply on one area and work towards becoming an expert.

What hobbies have you recently picked up?

My partner and I recently adopted two kittens, Cosmo and Balthazar, so I spend some of my free time playing with them.

Faculty Spotlight

Jose A. Sanchez Gomez

Where did you receive your graduate degree?

I received my PhD in Statistics at UNC-Chapel Hill. Before this, I studied my undergraduate in mathematics at Universidad de Guanajuato in Mexico.

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

The summer of 2022, I participated in an internship at the German Research Institute for Artificial Intelligence (DFKI). Jointly with a group of wonderful computer scientists, software developers and political scientists we worked designing neural network models for preprocessing vast datasets of unstructured document data for Organized Crime and Corruption Reporting Project (OCCRP), to make the information of these documents more readily available for journalists to use in their investigative stories. It was a great learning experience to collaborate with people from other disciplines, and join efforts to solve a real-world need!

What kind of research have you done? How can your research be applied to other data sets?

In many scientific applications such as neuroimaging, genetics or finance, practitioners are interested in estimating how massive sets of variables (genes, regions in the brain, market indexes) connect and relate to each other. A popular approach for this consists of constructing a network where nodes correspond to variables, and links represent pairwise variable relationships. Such graphs are known as Graphical Models (GM). While many methods have been proposed for estimating GMs, they are often computationally costly for large numbers of variables (more than a couple thousand variables), which constitutes a challenge for modern applications. In this context, my work focuses on developing methods for the computationally efficient estimation of structure in graphical models, especially for high-dimensional data. My goal is to construct methods that, given a high-dimensional database, derive communities, hubs, and other properties of the graphical models, without the computationally costly step of reconstructing the full relationship network. I have studied efficient methods for hub estimation in the single-population case, and I am currently working on extensions for the estimation of common and individual hubs across multiple populations. As this area has remained relatively unexplored, there are great potentials for novel algorithms that can effectively estimate network structure at low computational costs.

In addition to my methodological research, I have participated in several interdisciplinary research projects. I have worked in collaboration with marine scientists, public policy scholars, political scientists and computer scientists in a variety of research questions.

I am excited to continue to develop my research program in UCR, and to find new areas of research and collaboration in statistical methodology!

How did your interest in statistics begin?

My interest in statistics appeared very gradually throughout my undergraduate studies. At first, I was focused on learning pure math. While interesting, I always felt a bit frustrated with not feeling a connection with real-world problems. To compensate for this, I took courses in the physics and economics department. With time, these experiences outside of math helped me realize the important role that statistics has in answering scientific questions across many disciplines. This led me to focus the second half of my undergraduate studies on learning probability and statistics. In the end, I really liked the opportunities that statistics brings for collaborating with people in other disciplines, and exploring challenging problems with data. These realizations helped me make the choice to pursue a PhD in statistics.

What advice would you give to other graduate students?

I really recommend applying for summer internship experiences! It provides the opportunity of meeting new people, understanding how working outside of academia is, and also realizing how your skills can translate to valuable outputs to others! It can become demanding and time consuming to prepare for interviews and stuff, but it ultimately is very much worth it! Also, at times of frustration and stress, take a walk and have a glass of water. It does miracles!

What hobbies have you recently picked up?

My most recent hobby is birding! I started in North Carolina last winter, and it has been great to learn more about what species are in your area! After the move to California, there have been so many new birds to be on the look for!

Incoming Graduate Students

Leslie Vazquez Moreno

M.S. or Ph.D. student?
M.S

Statistical Interests
Survival analysis, cluster analysis, causal inference, infectious disease modeling, high dimensional statistics

What is your favorite color?
Blue

What are your hobbies?
Hiking, soccer, yoga, baking, puzzles

What is one fun fact about yourself?
I like to go to art museums. I particularly liked the paintings in the Cheech Art Museum in Riverside

What is your favorite board game? Why?
My favorite board game is scrabble because it is interesting what words come out of it.

Liming Zhao

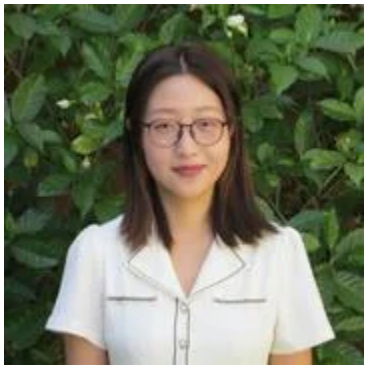
M.S. or Ph.D. student?
Ph.D.

Statistical Interests
Biostatistics, Machine Learning

What are your hobbies?
Travel, photography, games, musical

What is your favorite leisure activity?
Games, TV shows

What is your favorite game? Why?
Zelda. It makes me feel relaxed and immersed.



Jingjing Zhang

M.S. or Ph.D. student?
Ph.D

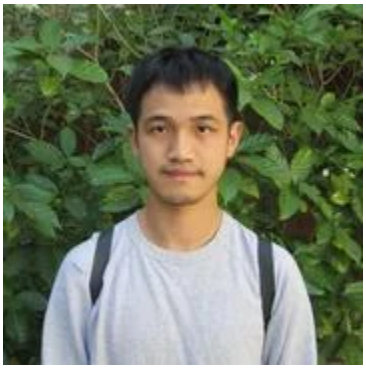
Statistical Interests
Applications in statistics

What is your favorite color?
Red

What are your hobbies?
Ping Pong (or other sports) and traveling

Ji Feng
Ph.D

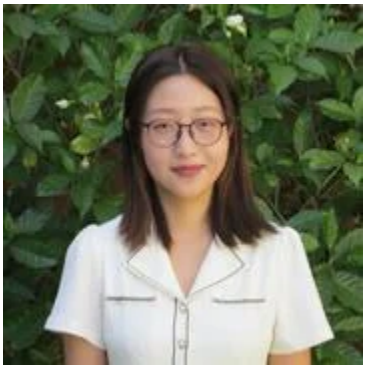
Zhuo Huang
Ph.D



Shijie Mao
Ph.D

Prosper Ogbonna
M.S

Xun Wang
Ph.D



Jingjing Zhang
Ph.D

Ask the Current Graduate Students

Evan Mason

What interesting plans do you have for the rest of the year?
Make a potato salad.

What's one thing you would like to try this year?
Winter outdoor cookout (with potato salad)

What's your favorite place to go to on campus? Why?
Panda Express, the most multicultural place on campus

Jericho Lawson

What interesting plans do you have for the rest of the year?
Relax and do some day trips around Arizona!

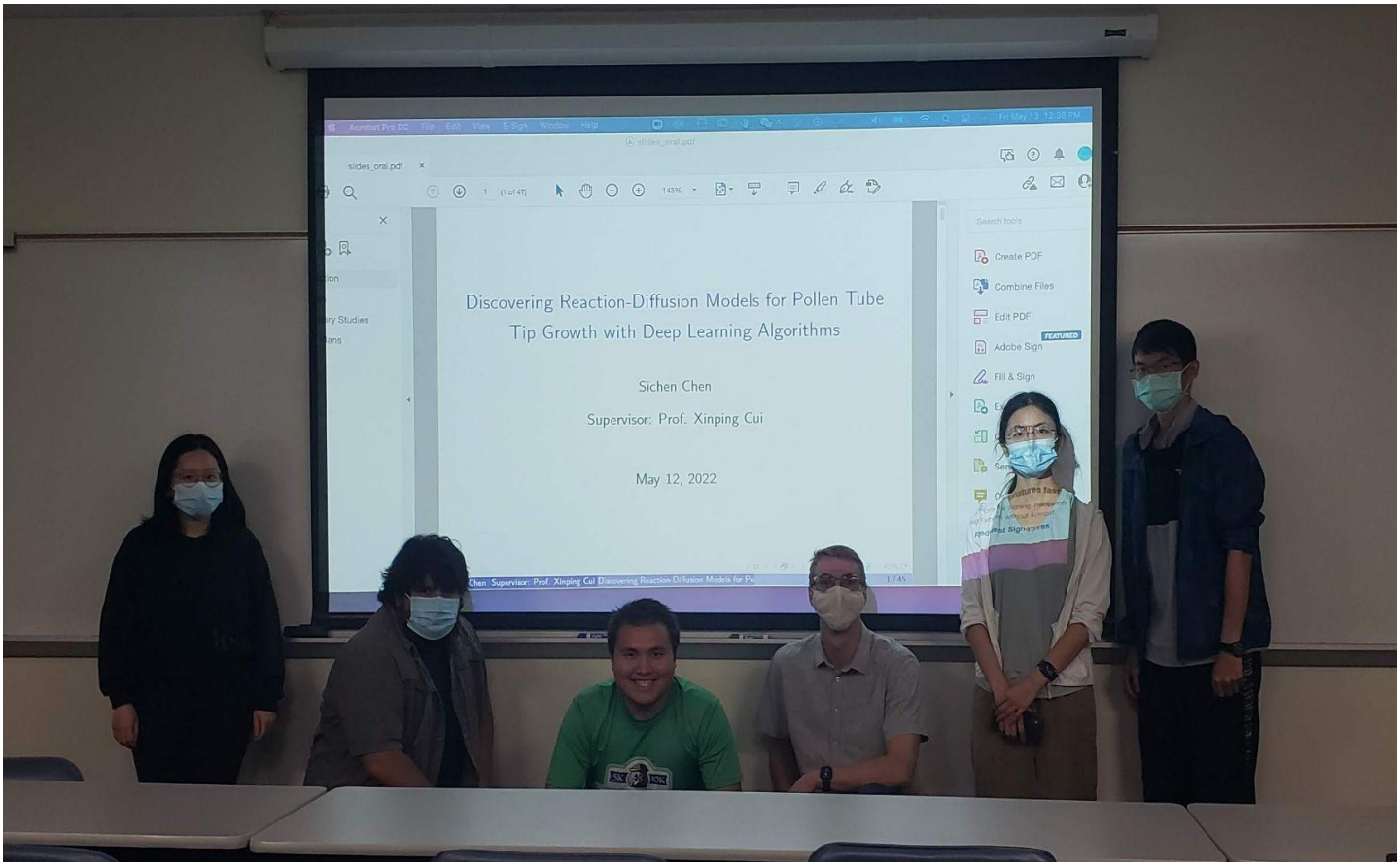
What's one thing you would like to try this year?
Actually making a consistent effort to go to the SRC to work out.

What's your favorite place to go to on campus? Why?
The hill on the south side of campus; you get incredible views of campus and Riverside.

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!

Important Dates

Event	Dates
Initial Registration Window	Nov. 6 - Nov. 30, 2023
Continuing Registration Window	Dec. 1, 2023 - Jan. 19, 2024
First Day of Winter Quarter	Jan. 3, 2024
First Day of Winter Instruction	Jan. 8, 2024
Academic and Administrative Holidays	Jan. 15, 2024 Feb. 29, 2024
Add/Drop Date Deadline	Jan. 19, 2024
Last Day to Withdraw from Course (no fee)	Jan. 19, 2024
Last Day to Change Grading Basis (no fee)	Jan. 26, 2024
Last Day of Instruction	Mar. 15, 2024
Finals Week	Mar. 16-22, 2024
Spring Break	Mar. 25-29, 2024
First Day of Spring Quarter	Mar. 27, 2024
First Day of Spring Instruction	Apr. 1, 2024

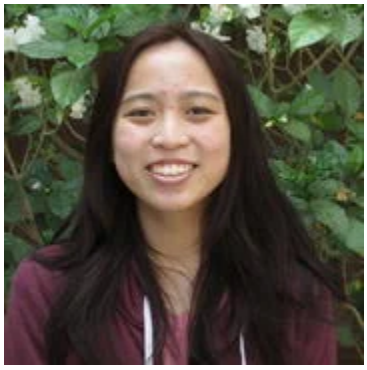
Mu Sigma Rho

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.

Board Members



Emily Ouyang
President

Trisha Agrawal
Vice President

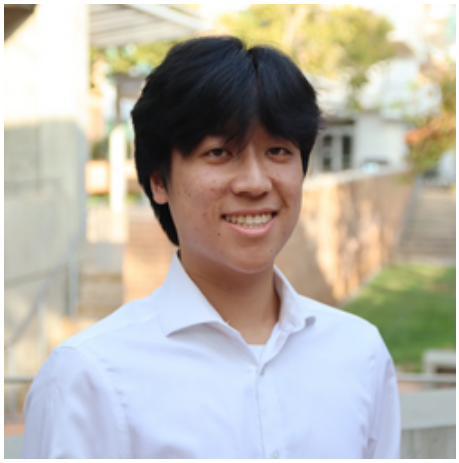
Jericho Lawson
Secretary & Treasurer

HiSS Officers

Surabhi Tadvalkar
President

David Ryan
Co-Vice President

Zaif Chowdhury
Co-Vice President



Aaron Lin
Treasurer

Ethan Tran
Social Media/Outreach Coordinator

Soumya Agarwal
Event Coordinator

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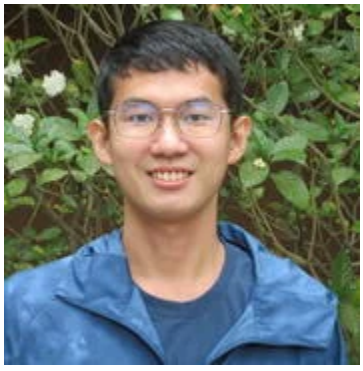

Chin-Sheng Teng
Secretary
cteng011@ucr.edu

Hello everyone!

We as a GSA would like to welcome you to the 2023 school year. Many of you all are familiar with us, but there are some new faces as well. We hope to best represent your voice and serve as the best liaison between staff and faculty as we possibly can. From our social events to the Graduate Student Seminars, we hope to better promote a community that is welcoming to you all.

Sincerely,
The 2023-2024 GSA Board Members

Feedback or Interested in Joining Us?

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