The Y-Distribution

Brigham Young University **Department of Statistics** **Vol. XXVI May 2025**

From the Chair, Dr. David B. Dahl

Welcome to this year's edition of the Y Distribution! Our department continues to thrive, enriched by student achievements, exciting events, and generous support from our alumni and friends.

We're pleased to report that the department currently enrolls 405 majors and celebrated 134 graduates in April 2025. This consistently large number of students underscores the strength of our programs and our ongoing commitment to student success.

Excitingly, the university and accrediting agency have officially approved the new major in Data Science, to be housed within our department starting Fall 2025. This interdisciplinary program will have curriculum oversight from the College Data Science Committee, including faculty from Statistics, Computer Science, Mathematics, and Physics and Astronomy. We look forward to welcoming students who declare this major and fostering a vibrant new academic community.

We are profoundly grateful to alumna Rebecca Nichols and her husband Luke Nichols, whose generous contribution of $157,500 established the "Joseph L. and Shelley M. Reimann Endowed Fund," honoring Rebecca's parents for their humble and dedicated service. This fund directly supports students through scholarships, internships, and meaningful experiential learning opportunities. Such support transforms lives, enabling students to graduate with less debt and greater opportunities—a legacy we're proud to nurture.

Our students continue to excel and make meaningful impacts beyond the classroom. Congratulations to Sam Lee, who won first place in the Civic Engagement category at the Fulton Conference! Sam's groundbreaking research, "Cluster-Robust Variance Estimators for Instrumental Variables," illustrates how increasing women's legislative representation significantly reduces carbon emissions in African and Arab countries. Sam's work demonstrates the profound influence statistics can have on global policy and environmental sustainability.

This past winter semester, we hosted an exceptional case study competition with approximately 50 students participating. More than a dozen alumni and friends of the department generously contributed their time as judges, providing invaluable feedback and mentorship to our students. Events like this highlight our community's collaborative spirit and dedication to real-world applications of statistical analysis.

We are thrilled to invite you to this year's Summer Institute of Applied Statistics featuring Dr. Sam Pimentel from UC Berkeley. Dr. Pimentel's course, focusing on causal inference with observational data and methods to address unobserved confounding, promises to be both insightful and practically valuable for anyone involved in data-driven decision-making. Additionally, we are excited to announce that Dr. Julia Silge has accepted our invitation to speak at the 2026 SIAS. Dr. Silge, known for her expertise in tidy models, will present "Develop, Evaluate, and Deploy Statistical Models." Planning these events well in advance helps us offer a vibrant experience for all attendees, so please mark your calendars!

As always, we warmly encourage our alumni to reconnect with the department. Your experiences, insights, and engagement mean so much to current students and faculty alike. Consider visiting us in the West View Building—your presence is always welcome. Additionally, alumni interested in mentoring our students can become involved through BYU Connect (https://alumni.byu.edu/byuconnect), further enriching student mentoring and professional development.

We look forward to seeing or hearing from you soon!

DEPARTMENT OF STATISTICS

FRIENDS AND ALUMNI OPEN HOUSE BREAKFAST 2025

JSM NASHVILLE TENNESSEE AUGUST 2–7, 2025

Statistics, Data Science, and AI Enriching Society

If you are attending JSM 2025 (or are in the Nashville, Tennessee area), please meet us at our annual Brigham Young University Breakfast. We look forward to seeing you there!

Honoring Dr. Del T. Scott: Five Decades of Innovation

This summer the department will see the retirement of Dr. Del T. Scott. No one in the history of the department, and perhaps even the university, has been more pivotal in bringing the power of the computer to BYU. From his very early years as a student, he took on the task of improving use of machine computation among his fellow undergraduates with missionary zeal. He has continued to be a driving force in migrating the university community into a computerized world ever since. When Dr. Scott first arrived on campus after finishing his PhD at Penn State (cir. 1977), the University was in the process of expanding its computer capabilities for both administrative needs (e.g. accounting, payroll, etc.) and faculty research. At that time there were few packages that were available for statistical computation. Consequently, Dr. Scott's primary assignment upon arriving on campus was to develop computational programs to resolve this problem. Dr. Scott developed an extensive program (called Rummage) that met many of these needs, and, in fact, was used by other researchers around the world. That program generated revenue that was instrumental in establishing both the Alvin J. Rencher and the Melvin W. Carter faculty awards that are still in existence. Dr. Scott's persistent activities in improving computational opportunities for the students and faculty represents a stellar example of a faculty member's efforts, mostly unsung, at availing all, students, faculty and staff to advantages of the digital world.

Dr. Scott subsequently accepted the assignment as Associate Academic Vice President for computing for the whole campus. In this position Dr. Scott was instrumental in creating a prototype classroom that included a ceiling-mounted projector, a wooden podium with built-in computer and monitor, a built-in DVD player, and a video switch controlled by the computer with attached cables for plugging in a laptop or other external devices. It was called a "Technology Equipped Classroom", or TEC room. As useful as this may seem to us now, it was an uphill struggle to get the TEC room accepted. Dr. Scott recruited a few students to completely computerize a course that one of the BYU Vice Presidents had been teaching for many years. The course was not a technical course but more of a humanities course with slide pictures and so forth. After migration of the course to a computerized format by Dr. Scott and his team of students was complete, Dr. Scott presented the course to the VP in a classroom environment. The VP stated that although he had many years of experience teaching this course, he saw several new things in Dr. Scott's presentation that he had never seen before. This sealed the deal on development of TEC rooms around campus. Dr. Scott oversaw the initial phases of this development. It has been stated by some that it would not be possible to teach over 70% of what we now teach in beginning and advanced undergraduate statistics courses without the TEC rooms.

Through his entire career here at BYU Dr. Scott has been mentor to a small army of students that worked in the interface of computer technology with statistical science and data gathering and cleaning. For some of these, the educational experience of working with Dr. Scott has been a singular educational experience. As a faculty member here for nearly five decades, Dr. Scott has been a principal mover in developing courses for bridging the statistical science discipline with other departments in computer use. This has included encouraging the Department of Statistics to purchase and use a wide variety of software programs. Many faculty on campus are served every day by these software tools.

Our Department, our College and our University community have been greatly benefited by the many activities, mostly unsung, that Dr. Scott has taken on to improve our teaching and research environment. We wish him well in his next adventure as he retires from our classrooms, but not from the digital age or our memories.

Student Sample

Below you will find glimpses into the sentiments expressed by a few of our students regarding their experiences in the Department of Statistics.

Gavin Hatch: I've known that I wanted to study statistics since I was a high school sophomore sitting in AP Statistics. The BYU Statistics Department has made my experience better than I ever could have dreamed. My Favorite part of my time here has been the relationships I've built. It's no surprise that our current BYU President rose from the ranks of the stats department. President Reese said," The most important decisions that will be made in my tenure as president at BYU are the people we hire." This department is no exception.

After bowling with Dr. Warr and playing actuarial card games with Dr. Tolley, I've learned that connection with our professors extends far beyond the classroom. More than just teachers of statistics, they are teachers of life. After a big exam, Dr. Hartman often gives a

lecture on personal finance. I've attended meetings on how to interview better and build stronger resumes. Above all, the faculty have strengthened my discipleship by bearing testimony in class and encouraging us to focus on the words of the prophets during General Conference weekend. All of this supplemental support has had a profound impact on my statistics education.

As a master's student, the members of my cohort have become my closest friends. From chess tournaments to April Fool's pranks, we always find ways to lift each other up amid some of the most challenging schoolwork we've ever experienced. A true character-building and mind-expanding experience this program has been.

Overall, this department has provided me with one of the most rewarding experiences. I will forever cherish the time I have spent here at BYU.

Grant Nielson: This year the statistics club put on a showing of *Moneyball* and asked me to give a quick presentation on the statistical elements of the movie. This film inspired me to study statistics and to pursue my dream of working in sports analytics, so it was fun sharing my passion with everyone in an educational way. My biggest takeaways from this experience are that a simple model, if well-reasoned, can be powerful; and that sometimes we are hitting home-runs in our education/career without realizing it. I'm grateful for the statistics club and department that have empowered me to explore my interests!

Daisy Harris: Being part of the BYU Statistics Department has been a wonderful experience. This was my first year in the master's program, and I loved both the classes and the opportunities it provided. My cohort was especially amazing; we were able to learn together while also forming strong friendships. We had the chance to get to know more about the faculty and learn from them. I especially appreciated the opportunity to research with Dr. Dahl and present our research on Learning Bayesian Networks at the Student Research Conference. I look forward to continuing that research.

The department also provided many chances to connect with others. The Statistics Club held a variety of great events throughout the year, and, as graduate students, we attended weekly seminars where we heard from researchers from all over. Working as a TA was another highlight, it's a great chance to meet other students and help them understand the concepts that I love.

I'm truly grateful to be part of a department with so many opportunities to learn and so many amazing people!

Chloe Morrill: Joining the Statistics Department has been one of the best decisions of my life! I've made some incredible friends in my classes as well as in my position as a teaching assistant for Stats 121. My professors have been such a good influence in my life, providing valuable information that allowed me to make the decision to become a Statistician and have supported me through the hard things I have faced. Their confidence in me has helped me to become more confident in myself and has encouraged me to branch out to try and learn new things! Their support, and the support of everyone else in the department, has changed my life for the better. I still have a lot to learn about statistics, but this journey was incredible. I couldn't be prouder to be a Statistics student here at BYU!

Evan Miller: This year I was able to complete the first year of the master's program. The highlight for me was all the unique work opportunities the program offers. I got to work in the consulting center, be a TA, and do research with my advisor, Dr. Hartman. These experiences have been great for diving deeper into the concepts we've learned throughout the program. My research with Dr. Hartman introduced me to financial statistics, something I hadn't really encountered in traditional coursework. Financial modelling builds on the concepts we've learned but also deals with unique data that requires modelling techniques I was unfamiliar with. There's so much to explore outside of regular class material, and these opportunities have given me great space to do that.

Brylee Wilcox: I had a great senior year within the statistics department. As a member of the stat club leadership, I was able to represent the stats department on the Women in Stem student board. I loved helping plan activities for students to connect with industry professionals. I also enjoyed participating in research with Dr. Sandholtz and Dr. Page and have loved diving into the statistical complexities of the sport of cross-country. I was able to present this research at the Student Research Conference in March. I am grateful to all my professors for their mentorship and guidance this past year. As an extra bonus, I was able to complete the stats program with my husband and graduate together. I look forward to starting the master's program in the fall and continue learning within the department!

Pictured above are members of the BYU Statistics Club Leadership

BYU Statistics Club

Dr. Jamie Perrett has been the faculty advisor of the BYU Statistics Club with Riley Williams as the student president.

49th Annual Summer Institute of Applied Statistics

We are honored to have **Dr. Sam Pimentel,** Assistant Professor at UC Berkeley, as our presenter at this year's conference. His presentation will include methods for making casual inferences robust to unobserved confounding. His course will begin with a review of the most common tools used for casual analyses in observational data, including matching, weighting, and doubly robust methods. He will then introduce leading approaches to sensitivity analysis, which assess the degree of unobserved confounding necessary to explain away an observed casual effect.

Additional topics will include design sensitivity—tools for planning observational studies to maximize robustness—as well as techniques to detect or mitigate the impact of unobserved confounding, such as negative control outcomes and multiple control groups. The Course will include illustrative applications from the health and social sciences, with hands-on implementation using R.

This year's summer institute will occur June 17-18, 2025. If you would like to attend, please register for the conference by June 10th, 2025. For more information on the schedule of SIAS and to register, visit https://statistics.byu.edu/sias.

Research Highlights

Dr. Matthew Heaton: Dr. Heaton has been leading a major redesign of the department's introductory statistics course (STAT 121), transforming it into a more hands-on, immersive experience centered around real-world data analysis. As part of this effort, he developed a user-friendly, R-based app to simplify data exploration for students. This summer, he is further enhancing the course by integrating AI tools—including Microsoft Copilot and ChatGPT—to support students in conducting data analyses. In collaboration with Dr. Hartman, Dr. Heaton also helped organize the department's inaugural Data Science Career Fair, which brought employers to campus to connect with students. His research continues to explore spatial extensions of machine and deep learning algorithms through active collaborations with researchers in agriculture, climate science, and engineering.

Dr. Jared Fisher: Dr. Fisher teaches probability and inference theory for undergraduate students and statistical learning for graduate students. His research projects span Bayesian methods, machine learning, causal inference, and sports analytics, often in collaboration with students and colleagues. Recent highlights include two papers that are accepted by journals to be published soon: the first examines expert aggregation for forecasting the NBA Draft (joint work with BYU alum Colin Montague), and the second model's highway crash risk with Bayesian regression trees (joint work with recent MS grad Benjamin Dahl and Drs. Heaton and Warr). He mentors a team of students who are researching advanced methods in basketball analytics. He recently finished his term as Secretary for the Economics, Finance, and Business section of ISBA and is now an Associate Editor for the Journal of Quantitative Analysis in Sports.

Dr. Nate Sandhotz: I joined the BYU Statistics faculty in Fall 2021, and I've loved it from the start. Prior to coming to BYU, I earned my PhD from Simon Fraser University in 2020 (h/t to President Reese—I only applied there because of him!) and completed a year-long postdoc at the University of Toronto during Covid. Teaching at BYU has been a marvel. Our students are incredible, and I see that more clearly every semester. They regularly inspire me. I'm also deeply grateful for my colleagues—this department is full of kind, supportive, down-to-earth people who take great care in building our department and educating our students. I feel lucky to be here.

My research focuses on making inference about why humans behave the way they do in complex decision problems. For example, I recently had a paper published in the *Annals of Applied Statistics* that examined what we can learn about NFL coaches' risk preferences based on their fourth down decisions. I've also had the chance to run an experiment with the BYU men's tennis team (big thanks to Gil Fellingham and Ron Hager—this project wouldn't have happened without them!) to study decision-making on tennis serves. That paper is still in preparation, but it's been well-received at several conferences.

Outside of BYU, I stay active in the sports analytics community. I served as the 2024 ASA program chair for the Statistics in Sports Section and recently joined the editorial staff of the *Journal of Quantitative Analysis in Sports* as an associate editor.

Go BYU Stats!

New Staff

Renea Scott joined our department in Winter 2025 as our new Business Manager." I feel truly blessed to be working in the Statistics Department. I experience authenticity at every turn and a genuine commitment to the students. Having been at BYU for nearly 20 years, I have developed a deep love for BYU's mission and its students."

Natalie Romeri-Grass joined our department in Spring 2025 as our new Data Science Program Administrator. She will be advising the new interdisciplinary Data Science Major housed within the Statistics Department.

New Faculty

Zoe McBride grew up in Denver, Colorado. In 2020, she received her Bachelor's and Master's degrees in Statistics from Brigham Young University and is currently completing her PhD in Statistics at the University of Connecticut. She is also an Associate of the Society of Actuaries. Her research interests include Bayesian methods with applications in actuarial science, as well as behavioral and mobile health. In her free time, she enjoys running, paddleboarding, and scootering with her two-year-old daughter.

Tom Kerby will graduate with his PhD in Mathematical Sciences with a specialization in Statistics at Utah State University, studying under Dr. Keving Moon and supported by the Presidential Doctoral Research Fellowship. Tom is a proud BYU alumnus, where he earned his undergraduate in Statistics with minors in Computer Science, Mathematics, and Molecular Biology. His current research focuses on interpretable machine learning, representation learning, and diffusion models. Tom's industry experience includes internships with Idaho National Laboratory, where he worked on detecting living-off-the-land cyber-attacks, with Enveda Biosciences, a biotech drub discovery company, where he applied large language models to predict molecular structures and properties, and with Family Search, where he has worked on automating the process of creating family trees. He married his sweetheart before coming to BYU and is the father of three children. In his spare time, he enjoys outdoor activities with his family, astrophotography, playing the piano, and cheering on BYU sports.

Awards

We have such wonderful faculty and staff here at the BYU statistics department and these awards are just a glimpse of their greatness. Here are a few of our department's more recent recognitions.

Excellence in Mentoring Award

Gil Fellingham: April 2024

Melvin W. Carter Professorship

Matthew Heaton: April 2024

Early Career Research Award

Nate Sandholtz: April 2024

Excellence in Teaching Award

Matthew Heiner: April 2024

Shannon Tass: April 2024

Excellence in Citizenship Award

Robert Richardson: April 2024

SAERA AWARD

Brandon Smith: April 2024

Dean's List 2024

Winter 2024

Jarom Asher
Tyler Barlow
Scott Brown
Aidan Christensen
James Christensen
Tyler Duke
Spencer Fong
Ethan Gertsch
Devan Gwynn
Ty Hawkes
Isabella Irwin
Jacob Johnson
Eli Ladle
Danika Lasson
Elijah Marler
Connor Meredith
Paul Morrison
Carson Payne
Brett Pedersen
Scott Preston
Daniel Sampson
Emilia Tolley
Chloe Walcott
Nathan Walter
Xaiya Wilkinson
Samuel Balls
Haley Briggs
Cameron Chamberlain
Caleb Christensen
Jacob Curtis
Shaelyn Eldredge
Hannah Gartz
Nathan Gordon
Jessa Halversen
Talmage Hilton
Collin Jensen
Mason Keep
Anthony Lapicola
Maxwell MacDonald
Andrew McKenzie
Evan Miller
Carson Ordyna
Seth Peacock
Logan Pedersen
Zachary Sabey
Daniel Sumsion
Nicholas Vorster
Matthew Walker
Brylee Wilcox
Matthew Woodworth

Spring 2024

Lindsey Allen
Sam Lee
Anna Fellars
Dallin Robinson
Ridge Atwood
Jared Elison
Carson Ordyna

Fall 2024

Samuel Balls
Matthew Walker
Samantha Richardson
Lydia Frischknecht
Nathan Weed
Tyler Barlow
Han-Po Huang
Preston Jones
Chance Day
Kenton Frederick
Devan Gwynn
Danika Lasson
Andrew Smith
Timothy Hardy
Amelia Mower
Madeline Smith
Josephus Colver
Rome Greenmun
Linnie McNiven
Riley Rawhouser
Daniel Sumsion
Connor Anderson
Emily Dunham
Yu-Ho Huang
Callie Lunt
Carson Ordyna
Janelle Slocum
Cedric Stephens
Bradley Swalberg
Caleb Christensen
Jarom Asher
Shaelyn Eldredge
Brielle Giles
Chayse Hartnett
Jessie Olsen
James Boone
Marcie Mortensen
Brett Pedersen
Jonah Stoddard
Maxwell Fairbourne
Connor Lowder
Mitchell Morehead
Dallin Seahorn
Matthew Woodworth
Eric Antillon
Anna Fellars
Anthony Lapicola
Kensei Nagao
Hailey Peterson
Kolten Smith
Andrew Stradling
Aisha Wilkins

2024-2025 Seminar Speakers

During Fall '24 and Winter '25 semesters, we were pleased to have many great presenters at our Thursday Seminar series.

Those who presented during **Fall 2024** included:

Jared Whitehead (BYU): Aliasing Beyond Bias and Variance, a Nearly Label-Independent Decomposition for Quantitative Risk

Nate Sandholtz (BYU): Investigating the Spatial Component of Serving Strategy in Tennis

Jeffery Dawson (University of Iowa): Thinking Outside the Box Plot: Nontraditional Roles for Statisticians

Alex Petersen (BYU): FunCLIME: Sparse Estimation of a Functional Precision Operator by Constrained L1 Minimization

Sameer Deshpande (University of Wisconsin): Scalable Targeted Smoothing in High Dimensions With BART

Jean-François Bégin (Simon Fraser University): Modeling Subnational Mortality in the Presence of Aggregated Data

Tim Swartz (Simon Fraser): Two Problems in Soccer Analytics

Zoe Gibbs (University of Connecticut): Dynamic State-Space Modeling for Determining the Long-Term Impact of Mobile Health Interventions

Steven Barnett (Virginia Tech): Generating Higher Resolution Sky Maps using a Deep Gaussian Process Poisson Model

Thomas Kerby (Utah State): Beyond Black Boxes: Learning Local Higher-Order Interactions for Interpretable Data and Models

Spencer Wadsworth (Iowa State): Bayesian Stacking via Proper Scoring Rule Optimization Using a Gibbs Posterior

Joe Guiness (Washington University St. Louis): Gaussian Process Computing with Vecchia's Approximation and the GpGp R Package

Those who presented during **Winter 2025** included:

Kuan Liu (University of Toronto): Bayesian Latent Variable Methods for Complex Observational Studies

Ron Wasserstein (Individual Researcher): Moving to a World Beyond P<0.05

Jonathan Bradley (Ohio State University): The Hierarchical Generalized Transformation Model for Spatial and Spatio-Temporal Data with Application to Wildfires

Alexandra Schmidt (McGill University): Coupled Markov Switching Models for Spatio-temporal Infectious Disease Counts

Maryclare Griffin (UMass Amherst): Doing More with Less: Statistical Methods for High-Dimensional and Correlated Regression Problems

Tianjian Zhou (Colorado State University): Random Coefficient Regression: Non identifiability and Nonparametric Estimation

Alejandro Jara (Catholic University of Chile): Bayesian Nonparametric Modeling of Mixed-Type Bounded Data

Peter Mueller (UT Austin): Common Atoms Mixture Models in some Biostatistical Inference Problems

Sebastian Kurtek (Ohio State University): Variograms for Kriging and Clustering of Spatial Functional Data with Phase Variation

Claire Bowen (Urban Institute/ Stonehill College): Responsibly Represent People in Data: Navigating Data Governance and Privacy Challenges in Public Policy

It is always wonderful to have experts come and share their knowledge and experiences with our faculty and students. Our students look forward to and appreciate their presentations. We would like to thank all of those who participated in our Thursday Seminars. For more information on each seminar visit: **https://statistics.byu.edu/seminars**

Opportunities to Teach

Have you ever thought it would be nice to contribute to the teaching mission at BYU? We regularly need adjunct professors to teach daytime and evening classes. If you think you might be interested in teaching classes, let us know. We generally need people with at least an M.S. in statistics, biostatistics, or a related field. To get on our list of potential teachers, contact Renea Scott, **rscott@stat.byu.edu**.

Pictured above are the 2025 MS Graduates

2024-2025 Graduate MS Projects

Jason Cook: Bayesian Clustering for Big Data using Splinters

Jared Grooms: Modeling Likelihood Differences in Men's Professional Tennis Rally Lengths

Xela Marchant: Impact of Oversampling on Class Imbalance in Classification Models

Andrew Millane: Adjusting for Spatial Correlation in Machine and Deep Learning

Katelyn Miller: Continuous Crash Risk Estimation from Discrete, Multivariate Crash Count Data

Andrew Pope: Interactive Hypothesis Tests for Separability Structure

Maycee Robison: A Multidimensional Convolutional Bootstrapping Method for the Analysis of Degradation Data

Adam Simpson: Fast Computation for Bayesian Spatio-temporal Factor Analysis

Sam Spackman: LLMs in Psychotherapy

Thomas Witney: Megafires and Watersheds: Spatio-temporal Dendritic Bayesian Modeling of Stream Recovery After Megafires in the Utah Lake Watershed

Make a Gift

Exciting things are happening in the Department of Statistics. As we strive to achieve the department's goal to help students develop their intellect and faith, our faculty teach the latest new concepts and skills, and administration and staff encourage and serve students. All help strengthen testimonies of Jesus Christ.

Your support helps this happen. Each donation makes a difference; no matter the size. Please make a gift and continue the tradition of giving back.

Scan the QR code to make a donation, or visit our website at statistics.byu.edu (under the alumni & friends tab)

Alumni and Friends of BYU Statistics

Recruit an Intern or a Graduate

Send an email to career.placement@stat.byu.edu with the job description, qualifications, and how to apply for the position. The information you provide will be forwarded to students and/or recent graduates of the Department of Statistics and posted on our website.

Get connected on

If you haven't already, create a professional profile for yourself on LinkedIn: Alumni and Friends of BYU Statistics / Actuarial Science. Stay up to date!

Like us on Facebook at: facebook.com/byustatistics

Follow us on Instagram: byustatistics

Please keep us up to date with your contact information!

To update your address, email statsec@stat.byu.edu

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