STAT NEWS

The official newsletter of ISU statistics.

IN THIS ISSUE

IOWA STATE UNIVERSITY
Department of Statistics

Letter From The Chair

Dear alumni, students, staff, faculty, and friends of the ISU Department of Statistics,

I hope 2019 has been good for you. The year has been eventful for me as I have moved into a new position as chair of the Department of Statistics on August 16, 2019. I joined Iowa State as an assistant professor in July of 2000. After moving through the ranks, I am now pleased to take on a new role in support of the department that has been so good to me for nearly two decades.

Shortly before becoming chair, I was in Denver for the Joint Statistical Meetings when it was announced that Hadley Wickham (2008 ISU Statistics PhD under the direction of Professors Cook and Hofmann) was named the 2019 recipient of the Committee of Presidents of Statistical Societies Presidents' Award to the top statistician less than 41 years of age. Hadley, Chief Scientist at RStudio and an Adjunct Professor of Statistics at the University of Auckland, Stanford University, and Rice University, was honored for his "influential work in statistical computing, visualization, graphics, and data analysis" including "making statistical thinking and computing accessible to a large audience." This is an amazing honor and a wonderful recognition of Hadley's work that has had a big impact on so many. Congratulations, Hadley!

We also have good news to share about the achievements of some current students. Statistics graduate students Qihao Zhang, Qinglong Tian, Xingche Guo, Yifan Zhu, Haoyan Hu, Gang Han, Haihan Yu, Lijin Zhang, Yueying Wang, and Wenting Zhao joined Shaodong Wang and Zerui Zhang, two students from the Department of Industrial and Manufacturing Systems Engineering (IMSE), to win first prize in the 2019 Data Mining Cup, an international competition featuring approximately 150 teams from 114 universities and 28 countries. The Department of Statistics at Iowa State has had several very strong showings in the Data Mining Cup in recent years. Students often attribute part of their success to the training they received in STAT 602: Modern Multivariate Statistical Learning, a course developed and taught by University Professor Steve Vardeman that has been an excellent addition to our curriculum.

One of the challenges of fall 2019 was getting our work done with four faculty on sabbatical (known as faculty professional development leave at ISU). Petrutza Caragea, Ulrike Genschel, Jarad Niemi, and Lily Wang were away from campus on other assignments. Their experiences have enabled them to contribute to our discipline in new ways and to build their knowledge bases in ways that will strengthen their future work as members of our department. We look forward to

welcoming them back to campus in 2020. With Professor and Associate Chair Petrutza Caragea away for fall, former chair Professor Max Morris played the role of associate chair and was extremely helpful to me as I learned my new chair duties. Thanks, Max!

The Department of Statistics and the Center for Survey Statistics and Methodology (CSSM) welcomed back Professor Jae-Kwang Kim (2000 ISU Statistics PhD under the direction of Distinguished Professor Wayne Fuller) on a full-time basis. Professor Kim joined our faculty in 2008 but split his time between ISU and the Korea Advanced Institute of Science and Technology from 2016 to 2018. We are pleased to have Professor Kim, one of our most productive researchers, with us in Ames year round. In other news regarding CSSM faculty, CSSM Director Zhengyuan Zhu was named to a College of Liberal Arts and Sciences Dean's Professorship. Congratulations, Zhengyuan!

We are very pleased to add a new tenure-track assistant professor to our department this fall. Lynna Chu earned BA and MS degrees from UCLA and a PhD in biostatistics from the University of California, Davis. She will teach courses for ISU's undergraduate Data Science program along with Statistics courses. Dr. Chu has expertise in graph-based change-point detection. In 2019, she published the article "Asymptotic distribution-free change-point detection for multivariate and non-Euclidean data" in The Annals of Statistics. Welcome, Lynna!

The year 2019 saw considerable upheaval in staffing throughout the university. On July 1, ISU moved to a new Improved Services Delivery (ISD) model in conjunction with the adoption of Workday software. Marlene Tjernagel, our account clerk and budget guru, moved to a 50% appointment. We now receive additional financial management support from Robin Jones, who serves several units in the new position of Cost Center Manager. Our administrative assistant Jennifer Grundmeier transitioned to a new human resources position in the College of Liberal Arts and Sciences. She was replaced by Kathy May, who held a split appointment with the Department of Mathematics. Kathy served the department well for a short time before moving to a different position at ISU in November. We will miss both Jennifer and Kathy, though we are fortunate to be able to work with Jennifer as our human resources partner. The search for a new administrative assistant is underway. Denise Riker, Jess Severe, and Kati Smith continue their excellent work for the department as undergraduate program assistant, graduate program assistant, and communication specialist, respectively. Kati put together the remainder of this 2019 newsletter. Please enjoy!

Sincerely,

Dan Nettleton, Ph.D.
Laurence H. Baker Endowed Chair
Distinguished Professor
Chair, Department of Statistics
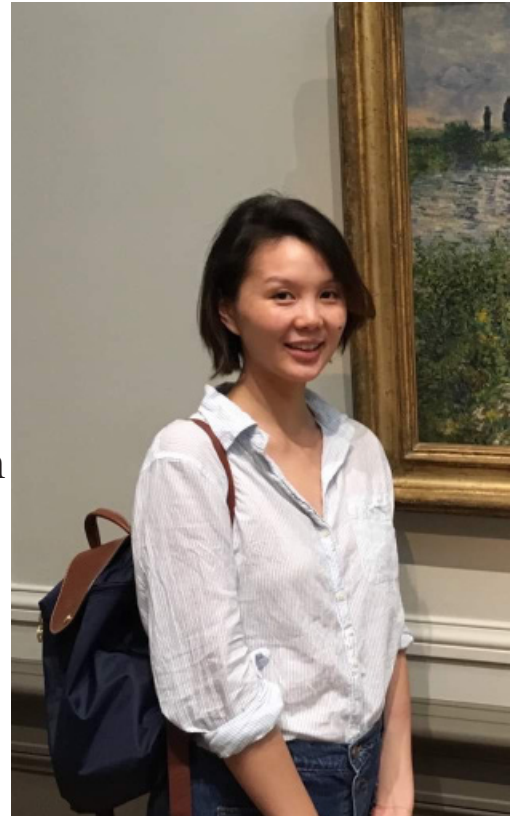Director, Baker Center for Bioinformatics and Biological Statistics

Hadley Wickham, ISU Alum, receives COPSS Award

Hadley Wickham was given the COPSS Presidents' Award at the 2019 Joint Statistitical Meeting (JSM) in Denver, Co. The COPSS Presidents' Award, sometimes referred to as the "Nobel Prize of Statistics", is presented to a person under 41 in recognition of outstanding contributions to the profession of statistics. Hadley received his PhD from the Department of Statistics at Iowa State University in 2008 under the supervision of Di Cook and Heike Hofmann.

New Faculty

We would like to introduce our new tenure-track assistant professor: Lynna Chu.

I was born and raised in California. I completed my undergraduate at UCLA and obtained my PhD degree in Biostatistics from UC Davis. My research is focused on developing nonparametric methods capable of handling modern data types, such as high-dimensional or non-Euclidean data. Currently, I am interested in change-point and anomaly detection problems. In my free time, I enjoy cheering (or despairing) for the Dodgers, reading (love LOTR), and exploring all things related to food.

LAS honors Zhengyuan Zhu with professorship

Zhengyuan Zhu, Professor of Statistics and Director of the Center for Survey Statistics and Methodology, has received a College of Liberal Arts and Sciences Dean's Professorship. His expertise is extremely broad, including spatial statistics, survey statistics, time series analysis, and multivariate analysis. He is also involved in optimal design for correlated observations, anomaly detection for correlated observations, spatio-temporal models, long range dependent processes, applications in environmental statistics, natural resource survey, agricultural statistics, biostatistics, astrostatistics, transportation statistics and Internet traffic modeling. "The Dean's Professorship award gives me more freedom and resources to pursue high-risk, high-reward research — which has large potential impact," said Zhu. The professorships are the result of Transforming LAS, an endowment fund created when two generous donors gifted proceeds from the sale of a company to the college.

2nd Midwest Statistical Machine Learning Colloquium

Last May, the Department of Statistics, along with the Department of Industrial & Manufacturing Systems Engineering (IMSE) held a workshop called the Midwest Statistical Machine Learning Colloquium. This was the 2nd year of this event after a tremendous turnout for last year's first conference.

The Midwest Statistical Machine Learning Colloquium is a one-day regional meeting of statisticians, engineers, computer scientists, mathematicians, and practitioners interested in the theory and applications of statistical machine learning. The purpose of the event is to bring together a diverse set of researchers and practitioners from multiple disciplines to discuss current motivating problems and methodological advances in theory-based machine learning.

There were six invited keynote speakers: Andrew Kuhl (Syngenta Seeds), Lizhen Lin (University of Notre Dame), Markus Sauter (Principal Global Equities), Nick Street (University of Iowa), Shiyu Zhou (University of Wisconsin-Madison), and Hui Zou (University of Minnesota). Following the talks there was additionally a poster session.

The event was made possible largely by Principal Financial. The meeting is co-sponsored by the National Institute of Statistical Science, and important additional financial support has been contributed by the Baker Center for Bioinformatics and Biological Statistics at ISU, the American Statistical Association Section on Statistical Learning and Data Science,

and the Kingland Data Analytics Faculty Fellowship at ISU. We are further grateful for generous financial support for the Colloquium from the ISU Departments of Statistics and of Industrial and Manufacturing Systems Engineering and the ISU Liberal Arts and Sciences, Engineering and Ivy Business Colleges.

Social Events

This year, the Spring Breakfast Picnic had to be quickly converted into an indoor event due to the rainy weather. The classroom in Snedecor 3105 was jam-packed full of students, faculty, staff, alumni, family, and friends. Although a little frenzied at times, the event was fantastic with a huge turn out and great food!

The Fall Picnic was held at Brookside Park in Ames on the evening before classes started. We had a record turnout – over 160 people showed up to have fun! It was a great fall Iowa day for outdoor activities. Those who attended had a wonderful time.

Team of Statistics and IMSE graduate students win international data mining competition

A team of Iowa State University graduate students beat nearly 150 teams from 114 universities in 28 countries, bringing home the top prize from the 20th annual Data Mining Cup. The winners were announced July 3 in Berlin Prudsys AG, a leading European data mining company, sponsors the intelligent-data analysis competition for universities. Data mining is essentially "finding and quantifying useful non-random patterns in large data sets," said Stephen Vardeman, University Professor of Statistics and Industrial

and Manufacturing Systems Engineering. Teams had six weeks to come up with a method to detect cases of fraud at self-checkout stations in grocery stores without putting innocent customers through unnecessary inspections. "I was really confident in our model because it captured the relationship between input and outcome," said Iowa State's first place team leader and Statistics Ph.D. candidate Qihao Zhang. "Sometimes people will try to use a complicated model, but the outcome may not be that stable. We developed a really simple model — which is not easy to find — to achieve our winning performance." In addition to Iowa State's first place win, a second Iowa State team placed eighth in the competition. This year's achievement adds to an impressive history at the Data Mining Cup. In 2013, Iowa State entered the competition for the first time and placed fifth. In 2014, Iowa State was the first U.S. team

to win the competition. Iowa State placed second and third in 2015, and second and fifth in 2016. This year, only 10 U.S. universities ranked in the competition, with George Washington University finishing third and the next closest to Iowa State's eighth place finish landing in 45th place. "Often, the top teams in these data mining prediction contests are within the margin of error from each other," Vardeman said. "But Iowa State's winners clearly blew the competition away this year."A jury scored all of the submitted solutions, and invited the top 10 teams to Berlin to present their solution methods at Prudsys retail intelligence summit, which examined how retailers can use artificial intelligence to be successful. Each team gave a 10-minute presentation. The first place Iowa State team received a prize of 2,000 euros (about $2,244) and a plaque. Switzerland's University of Geneva took second place, and Washington, D.C.'s George Washington University placed third. Iowa State's first place team members and their departments are Xingche Guo (statistics), Gang Han (statistics), Haoyan Hu (statistics), Qinglong Tian (statistics), Shaodong Wang (industrial and manufacturing systems engineering), Yueying Wang (statistics), Haihan Yu (statistics), Lijin Zhang (statistics), Qihao Zhang (statistics), Zerui Zhang (bioinformatics and computational biology), Wenting Zhao (statistics) and Yifan Zhu (statistics).Iowa State's eighth place team members and their departments are Oscar Aguilar (statistics), Reyhaneh Bijari (industrial and manufacturing systems engineering), Souradeep Chattopadhyay (statistics), Kanak Choudhury (statistics), Samira Karimzadeh (industrial and manufacturing systems engineering) and Hanisha Vemireddy (industrial and manufacturing systems engineering). Aguilar, Guo, Tian, Zhu and Yueying Wang went to Berlin for the presentation and announcement. "This is absolutely independent external validation of the strength of our students and our programs," Vardeman said.

"Corporate" Graduate Assistantships in the Department of Statistics

Most graduate students in the Department of Statistics are assigned to graduate assistantships that involve either teaching responsibilities for the department or research responsibilities in conjunction with a faculty member's grant. However in recent years, some of these assistantships have been developed in conjunction with corporate partners, essentially allowing a student to have a part-time internship in Ames during the regular school year. Here's how this works.

In brief, we sign a contract with the company to provide statistical support for 20 hours per week (the typical research assistant time commitment) for one or more semesters. The contract is signed by the company and university and is processed through our grants and contracts office. The company pays the university, and the funds are used to support a graduate assistantship for the student (tuition and stipend at our usual rate) for the prescribed length of time. With this set-up, the student is actually an employee of the university rather than the company, an arrangement that is especially helpful for some international students. For the most part, department faculty are not directly involved. The work done by the student is generally what we would call consulting and most often is not related to their dissertation research. The experience is comparable to that of many industrial summer internships, but may last more than one term, and is such that the student can do the work from campus.

The Statistics Department chair and associate chair handle the process of arranging these graduate assistantships and identifying students who are good candidates. In some cases, the company also participates by interviewing students we identify as candidates. Before such a graduate assistantship is finalized, a contract must be approved by the university grants and contracts office; invoicing and fund transfer is handled by our central administration. There is usually little direct faculty oversight of the students (and so they must be relatively mature and independent), but as the university contact for these arrangements, the chair receive feedback from the companies on the student's performance. In most cases, the students involved in these arrangements participate with a company for multiple semesters.

These agreements are usually initiated by the companies, with communication to our department asking about opportunities to work with our students. Beyond financial support, the benefit to the student is primarily in the form of professional experience. Although the immediate benefit to the company is the work done by the student, there is often also an interest in getting an early look at a potential employee, much as with many summer internship programs. For the department, these arrangements supplement our state-funded teaching assistantships and grant-funded research assistantships, giving us a bit more flexibility in how we arrange support for our students.

Send Us Your News!

We want to keep in touch with you. As alumni of the Iowa State University Department of Statistics, you are an important part of our statistical community. We are interested in hearing news of both your professional and personal accomplishments. Stories of our alumni help us promote the department and the discipline of statistics to potential students. Our success as a department is demonstrated in YOU!

In addition to news, if you have memories of the department or of professors who have had an impact on your life and career that you would like to share, please send them! Photos are also welcome!

Please email your news and photos to Dan Nettleton at dnett@iastate.edu

2018-19 Ph.D. Graduates

The individuals named below completed Ph.D. requirements in the Department of Statistics between August 2018 and August 2019. Their dissertation titles and names of their major or co-major professors are also listed. We are proud of all our graduates, and look forward to hearing of their future accomplishments.

BERRY NICHOLAS, *Extending K-Means,* Maitra

BI RAN, *Statistical Methods for Gene Expression Studies Using Next-Generation Sequencing Experiments,* Liu

CHAKRABORTY ABHISHEK, *Some Bayes Methods for Biclustering and Vector Data with Binary Coordinates,* Vardeman

CZAHOR MICHAEL, *Improving Reliability in the Wind Energy Industry via Field Failure Predictions Based on Life, Maintenance, and Dynamic Data from Supervisory Controls and Data Acquisition Systems,* Meeker

DIXIT ANAND, *Developments in MCMC Diagnostics and Sparse Bayesian Learning Models,* Roy

DU YINGZHOU, *Choosing Cutoff Values for Correlated Continuous Diagnostic Data to Estimate Sensitivity and Specificity,* C. Wang; Wu

JI JU, *Statistical Causal Inference Methods and Spatio-Temporal Modeling for Animal and Human Health Data,* Annette O'Connor; C. Wang

LEE DANHYANG, *Topics on Small Area Estimation, Multilevel Models, and Semiparametric Imputation,* Berg; Kim

LEOS-BARAJAS VIANEY, *Incorporating Multi-Scale Structures and Physiological Processes into the Modeling of Animal Movement,* Kaiser

LEWIS-BECK COLIN, *Modeling Crop Phenology Using Remotely Sensed Data,* Caragea

MU JINGRU, *Spatially Varying Coefficient Models: Theory and Methods,* L. Wang

REY KATHLEEN, *Some Bayesian Methods for Univariate Density Estimation,* Nordman; Vardeman

ULLOA NEHEMIAS, *Bayesian Hierarchical Modeling for Disease Outbreaks,* Niemi

WANG JUE, *Studies on Semiparametric Spatial Regression Models,* Steven Hou; L. Wang

YUAN CHAOHUI, *Statistical Methods for Microbiome Data and Antimicrobial Resistance Analysis,* Liu; C. Wang

ZIMMER STEPHANIE, *Stratification for Area Frame Surveys with Multiple Estimation Goals,* Kim; Nusser; Zhu

ZHANG HAOZHE, *Topics in Functional Data Analysis and Machine Learning Predictive Inference,* Yehua Li; Nettleton

2018-19 Master's Graduates

CHEN ZHENZHEN, Berg

DAI FAN, Dutta

DARLINGTON JESSE, Vardeman

HARMS STEVEN, Berg

JIANG HE, Froelich

KUTTUBEKOVA GULZINA, Niemi

LLOSA CARLOS JONATHAN, Maitra

O'CONNOR EMILY, Meeker

PARIS REID VINCENT, Morris

PODDATURI DINESH REDDY, Sabzikar

STUART MATT, Yu

SUN XIYUAN, Niemi

TIAN QINGLONG, Meeker

TILTON MIRANDA, VanderPlas; Ommen

WANG YUCHEN, Genschel

ZHANG XIN, Zhu

ZHANG YUDI, Dorman

ZHANG YUE, L. Wang

ZHONG XIAOJING, Kaiser

ZHU YIFAN, Maitra

Statistics Undergraduates Making the Grades

Deans List Fall 2018

Ashley Anderson
Liuyi Bao
Isaac Barrash
Hao Chen
Yiqun Chen
Julian Duran
Emma Engelbert
Nicholas Freelove
Grant Gingrich
Kevin Gnaster
Hanson Gunawan
Marie Hardt
Sarah Heuschele
Shuolin Hu
Lynn Huang
Jennie Huxford
Adrianna Kallis
Blake Kassmeyer
Hanqing Liang
Abbigail Markus
Aryana Miller
Zimeng Peng
Thomas Pollard
Weston Powers
Anyesha Ray
Joshua Redmond
Sara Ronnkvist
Grant Ruedy

Samuel Schaecher
Macy Scheideman
Jacob Schwenneker
Kyung Seo
Yi Shen
Tyler Smith
Eric Steyer
Cameron Stocker
Han Sun
Andrew Sundberg
Kerstin Swanson
Derek Thada
Jacob Townsley
Grace Trost
Laurence Vander Werff
Samantha Vondrak
Saiyothin Vongpanya
Matthew Voss
Aisha Washington
Christopher Wesseln
Jaeyeon Won
Yijie Wu
Zhehao Xing
Alysa Younkin
Xinyi Zhu
Shangkun Zuo

Deans List Spring 2019

Jake Alston
Ashley Anderson
Liuyi Bao
Isaac Barrash
Matthew Bleeker
Mikaela Blount
Taylor Buske
Matthew Callahan
Hayley Corkin
Julian Duran
Emma Engelbert
Grant Gingrich
Kevin Gnaster
Isaiah Hamlette
Marie Hardt
Julia Hernesman
Sarah Heuschele
Shuolin Hu
Lynn Huang
Jennie Huxford
Matias Ibarburu
Adrianna Kallis
Blake Kassmeyer
Hanqing Liang
Weinan Liu
Yangyifan Lu
Cecilia Millane
Regine Peters

Thomas Pollard
Weston Powers
Joshua Redmond
Josef Rogers
Grant Ruedy
Kyung Seo
Yi Shen
Tyler Smith
Abe Stephenson
Eric Steyer
Cameron Stocker
Derek Thada
Jacob Townsley
Grace Trost
Kerrigan Urbi
Laurence Vander Werff
Saiyothin Vongpanya
Matthew Voss
Aisha Washington
Jaeyeon Won
Yijie Wu
Zhehao Xing
Jiadi Yang
Yanqi Zhang
Xinyi Zhu
Joshua Zimmerman

STAT-ers News

The department of statistics has been busy this semester, and STAT-ers is certainly no exception. This year there are 49 statistics graduate students involved with the group, 18 of those members being brand new.

We have hosted many academic events this semester including a STAT-ers Seminar, Career Workshop, and several company visits. To balance the academic events, we have also held numerous social events this semester. Some of these include a welcome picnic, homecoming tailgate, trick-or-treating, community service, and many FACs.

Other events that are to come in the spring semester are the International Dinner, Spring Breakfast Picnic, a Research Exposure Breakfast, and more seminars and FACs.

During a department award ceremony, two of our members accepted awards for their academic accomplishments. Congratulations to Hao Sun for receiving the Holly and Beth Fryer Scholarship, and to Joe Zemmels for receiving the Early Academical Achievement award.

STAT-ers Officers:

President: Min Zhang
Vice President: Earl Hur
Secretary: Joe Zemmels
Treasurer: Charlie Labuzzatta
Social Chair: Miranda Tilton

I used to be a statistician

CRÉPES

Dear previous STAT-ers members,

It has been my great pleasure to serve as President of STAT-ers for 2019-2020 academic year. With the purpose of promoting social and academic advancement in the field of statistics for graduate students at Iowa State University, we have hosted various events. The success of our events comes from the dedication of our officers and passion of our members. We are also grateful to those who provided funding to our club, including the ISU Graduate and Professional Student Senate (GPSS), the contributors of the department foundation, and American Statistical Association (ASA).

Looking to the future, we STAT-ers will continue with more interesting and beneficial activities. We are expecting to see alumni from both industry and academia to come back to Snedecor Hall and share with us career insights and catch up with friends.

Sincerely,
Min Zhang,
President of Iowa STAT-ers.

Nettleton appointed chair

Iowa State University's College of Liberal Arts and Sciences and College of Agricultural and Life Sciences announced the appointment of Distinguished Professor of Statistics Daniel Nettleton, the Laurence H. Baker Chair in Biological Statistics, as chair of the Department of Statistics.

Nettleton, a national leader in statistical genomics, will begin his five-year term as chair effective August 16, 2019. He succeeds Max Morris, who will remain a professor in the department.

"The Department of Statistics has done much to support me over the years," Nettleton said. " I look forward to giving back to the department in my new leadership role and helping the department and its people prosper in the years to come."

Nettleton is highly regarded for his collaborative approach to researching innovative statistical methods for design and analysis of high-dimensional biological datasets. His focus in the area of plant and animal biological systems is furthered in his position as director of the Laurence H. Baker Center for Bioinformatics and Biological Statistics.

"As the science of drawing conclusions from data, statistics has much to offer to the Iowa State community and beyond," Nettleton said. "I look forward to working with Department of Statistics personnel to share our knowledge of statistics with students and researchers and to develop statistical methodology useful for solving important problems."

The department is jointly administered by the College of Liberal Arts and Sciences and the College of Agriculture and Life Sciences. Established in 1947, the department's research and educational contributions have permeated the entire Iowa State campus; even more today as data

becomes critical to solving the world's most pressing issues. In addition to offering a bachelor of science and a minor in statistics, the department's graduate program is ranked among the top 20 in the nation, and offers a master's and a Ph.D. in statistics.

Nettleton's work has earned wide-spread recognition and funding from many organizations and institutes, including the National Institute of Food and Agriculture, the United States Department of Agriculture and multiple awards from the National Science Foundation. In addition to his outstanding research, he has been recognized by students, faculty and administration for his exceptional teaching and support as a mentor. Most recently he received Iowa State University's 2017 Margaret Ellen White Graduate Faculty Award for excellent guidance and encouragement of graduate students.

Nettleton earned his master's degree and Ph.D. in Statistics from the University of Iowa. He currently serves as chair of the American Statistical Association Section on Statistics in Genomics and Genetics and is an active member and leader in conferences and committees throughout the nation.

Dear reader,

The Department of Statistics newsletter is published for the alumni, friends, students, and faculty of the Department of Statistics, an academic department in the College of Liberal Arts and Sciences, and the College of Agricultural and Life Sciences at Iowa State University, It provides the latest news and achievements of the department and we are thrilled to share it.

Kind regards,

Department of Statistics
Iowa State University