# DEPARTMENT OF STATISTICS STATISTICS NEW





#### LETTER FROM THE DEPARTMENT HEAD

John Stufken | Department Head

Dear Alumni and Friends:

The academic year 2013-14 is coming to a close, and I would like to share a few highlights with you. You can find more details for most items in other sections of this Newsletter.

We are delighted that Associate Professors Ping Ma and Wenxuan Zhong, who were previously at the University of Illinois at Urbana-Champaign, have joined our faculty. Both Ping and Wenxuan have externally funded research programs with significant interdisciplinary components. In their short time at UGA, they have already had a significant impact on campus.

The arrival of Ping and Wenxuan brings the number of tenured and tenure track faculty in the Department to 20. With 6 non-tenure track faculty, this brings our total to 26 faculty.

Another new face is that of Zaid Abdo. In 2013, Zaid joined the USDA Agricultural Research Service in Athens, where he assumed responsibility for the South Atlantic area. Before coming to Athens, Zaid was an Associate Professor at the University of Idaho. To facilitate opportunities for developing professional relationships with our faculty and students, Zaid has been approved as an Adjunct Associate Professor in the Department.

The successful promotion of Lily Wang was a highlight in 2013. Lily is now an Associate Professor with tenure. The awards received by our faculty in 2013 and 2014 offer testimony to their excellence in research and teaching. Award recipients

include Lynne Billard (the COPSS Florence Nightingale David Award), Chris Franklin (the USCOTS lifetime Achievement Award in Statistics Education and a Fulbright Award for the spring of 2015), Lynne Seymour (a UGA Study in a Second Discipline Award for 2014-15), Lily Wang (a 2013 Franklin College M.G. Michael Award for Research Excellence), Jack Morse (a 2014 Franklin College Sandy Beaver Excellence in Teaching Award), and Abhyuday Mandal and Cheolwoo Park (2013-2014 Sarah Moss Fellowship Awards).

"In terms of teaching, we have continuously increased our credit hour production over the past several years. Thus we are reaching more students..."

There were many other noteworthy accomplishments in the area of research. For example, 15 of our 20 tenured or tenure track faculty were PI or co-PI on grants or contracts for extramural funding during 2013. The same number of faculty served in editorial positions for one or more academic journals during 2013, combining for a total of 29 such appointments. The faculty also produced approximately 80 research articles that were published or accepted in 2013, often in the very best professional journals. Research excellence is critically important for the reputation of the Department, which bolsters the value of the degrees of our alumni.

In 2013, we hosted another major international conference, the Fourth International Workshop

in Sequential Methodologies, with T.N. Sriram as one of the principal organizers. Events like this offer excellent opportunities to showcase the Department and to provide students with a chance to interact with leaders in the field. A vigorous seminar series can also help to accomplish this, and we attracted many outstanding speakers during the past year. Details can be found on page 3 of this Newsletter.

In terms of teaching, we have continuously increased our credit hour production over the past several years. Thus we are reaching more students, and this applies both to statistics students (we have more students in our undergraduate and graduate programs) and to students in other disciplines. In academic year 2008-2009, we taught a total of 14,347 credit hours; in 2012-13 (the last year for which figures are available) this number had risen to 19,588 hours, with a further increase expected for 2013-14.

Efforts to improve our courses and programs, at all levels, are also a constant focus. In 2013, this resulted in the addition of a linear algebra requirement for the undergraduate program, the introduction of an undergraduate directed studies course, the development of a proposal for an MS degree program in statistics education (which is currently going through the approval process), and discussions to revise our statistical consulting course. A comprehensive review of our Learning Outcomes Assessment procedures is also underway, which will help to ensure that we have the information we need to (continued on page 2)

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# LETTER FROM THE DEPARTMENT HEAD (continued)

John Stufken | Department Head

constantly keep improving.

Speaking of consulting, the Statistical Consulting Center continued to grow in 2013. In fiscal year 2012-13, its income was nearly \$100,000, with additional support for salaries and space coming from multiple other sources. The SCC also established a graduate student Consulting Award. The inaugural 2013 award, sponsored by Unclaimed Property Consulting & Reporting, LLC, went to Nan Zhang.

At the undergraduate level, 2013 was the inaugural year for the Kermit Hutcheson Best Capstone Student Award. Made possible by a generous donation from Professor Emeritus Kermit Hutcheson, the award went to William Thomas Purvis.

In 2013, we also received a commitment for a donation to establish an endowed fund that will help to support our graduate students. Once the principal has

been invested, interest will be used to create opportunities for graduate students, such as support for travel to professional meetings.

Efforts to recruit graduate students will be led by the person in the newly created position of Director of Graduate Admissions. We are delighted that Cheolwoo Park has agreed to be the first Director.

While we remain in the building that we have occupied for almost 30 years now, efforts to improve it never cease. Under the initiative of Business Manager Tim Cheek, we completed major renovations in 2013, and our diamond in the rough is the renovated Cohen Room. If you haven't been back to the Department in a while, please come and visit us to see this beauty!

While we have many reasons to be proud, there are also many ways in which we can become

better. A good strategic plan can help with this, and we are working on fine tuning our current plan. Attracting the best faculty and graduate students will also help, but competition is stiff. Endowed professorships and graduate fellowships can help, and if you are in a position to consider helping us with this, I encourage you to explore this possibility with the Office of Development & Alumni Relations in the Franklin College of Arts and Sciences. Donations, large or small, have increasingly become critical to maintain programs of high quality, and we are very appreciative for your continued support.

I hope that you enjoy the articles in this Newsletter, and look forward to meeting many of you during the next year, either here in Athens or anywhere else on the planet.

John Stufken



# FACULTY AWARDS

#### Lynne Billard

COPSS Florence Nightingale David Award

This award, jointly sponsored by COPSS and the Caucus for Women in Statistics and awarded in odd numbered years, recognizes "a female statistician who exemplifies the contributions of Florence Nightingale David."

#### **Christine Franklin**

USCOTS Lifetime Achievement Award

This is a biennial award presented to individuals who, over an extended period of time, have made lasting contributions with broad impact to the field of statistics education.

Fulbright U.S. Scholar Grant

Awarded by the U.S. Department of State Bureau of Educational and Cultural Affairs, these prestigious grants send U.S. academicians and professionals abroad to pursue educational and research exchange opportunities.

#### Nicole Lazar

Association (ASA)

Published in "The Best Writing on Mathematics"
According to the Princeton University Press, "this annual anthology brings together the year's finest mathematics writing from around the world."

Named the next Editor of The American Statistician Dr. Lazar will begin duties as Editor-Elect on July 1, 2014 and become the Editor on January 1, 2015. Selected as a Fellow of the American Statistical

# Abhyuday Mandal and Cheolwoo Park Sarah Moss Fellowship

This fellowship is awarded to tenure-track faculty who "show promise of unusual accomplishment in study."

#### Ping Ma

Faculty Fellow of the National Center for Supercomputing Applications (NCSA)

The NCSA offers Faculty Fellows opportunities to develop "long-term research activities within its interdisciplinary, collaborative, and computational environment."

#### Jack Morse

Special Sandy Beaver Teaching Award

The Sandy Beaver Excellence in Teaching Award recognizes faculty in the Franklin College of Arts and Sciences who show a sustained commitment to high-quality instruction; particularly those engaged in undergraduate teaching.

# Lynne Seymour

Provost Study in a Second Discipline Fellowship
This fellowship will allow Dr. Seymour to work with
climatologists in the Department of Geography in 201415.

#### Lily Wang

M.G. Michael Award for Research Excellence
This award serves to "encourage the development of a new (and perhaps adventurous) idea or project..."

Promoted to Associate Professor with Tenure

# UNDERGRADUATE PROGRAM UPDATE

Christine Franklin | Undergraduate Coordinator

Since last year's newsletter, we proudly graduated the following students with a BS degree in Statistics: Spring 2013 - Chad Arnest, Glenn Branscomb, Xiao Cheng, Jay Cromwell, Abigail Deel, Jerry Griffin, Ting Ting Huang, Lauren Langhorne, Austin Layton, Wesley McLarty, Matthew Passarello, Hao Peng, Christopher Rink, Daniel Robinson, Candace Rushing, Steven Shelton, Adithya Sudarshan, and Stewart Zellars; Summer 2013 – Morgan Webb; Fall 2013 - Muneeb Ahmed, Sara Lindsey, Onkar Medhekar, and Thomas Purvis.

As in the past, several of our students have been inducted into honor societies such as the National Statistical Honor Society Mu Sigma Rho, Phi Kappa Phi, and Phi Beta Kappa. Some of the students will continue with graduate school and others are planning on joining the workforce using the skill set they gained as a statistics major. Our students are sought out by future employees in this data centric world. Congratulations to all our graduates!

A big thank you to Megan Weatherford for her fabulous work in updating the department webpage! Check it out at: <u>www.stat.uga.edu/undergraduate-students</u>

Our undergraduate program continues to thrive with UGA students recognizing the importance of a background in statistics – this is seen in the

increasing number of both majors (approximately 100 students) and minors. The faculty approved a new prerequisite for our students (Math 3300: Applied Linear Algebra) and approved a new course (Stat 4950) that allows for undergraduate students to work with faculty on approved directed studies. Our year-long capstone course continues to shine as a gem in our undergraduate program. This past May 2013, we awarded the inaugural Kermit Hutcheson Best Capstone Student Award to Thomas Purvis. We continue to have several students taking advantage of internship opportunities. We welcome any leads on internship possibilities for our students.

# GRADUATE PROGRAM UPDATE

Lynne Seymour | Graduate Coordinator

As a result of the program review in 2013, the duties involved in running the graduate program have been divided between the Graduate Coordinator and the newly-created Director of Graduate Admissions. As of January 1, 2014, Dr. Cheolwoo Park took over the new position.

Dr. Park's new duties include recruiting and admissions, while the duties of advisement and running the graduate program remain with the Graduate Coordinator.



Dr. Cheolwoo Park, inaugural Director of Graduate Admissions

# UPDATE: Colloquium Series

Abhyuday Mandal, Associate Professor | Pengsheng Ji, Assistant Professor Cheolwoo Park, Associate Professor | Lily Wang, Associate Professor

The UGA Department of Statistics featured a great series of colloquia in 2013-14. On top of the regular seminar series, the department hosted a joint UGA-Clemson seminar and the Bradley Lecture in the spring of 2014. Most of the invited speakers were from outside of Georgia; beyond presenting, they interacted with our faculty and graduate students, and learned about our department, university, and the Athens community.

A total of thirteen talks were held during the 2013 Fall Semester. Seven of them were hosted jointly with the Department of Epidemiology and Biostatistics. The talks covered a wide range of topics, from theoretical foundations to applications, including high dimensional analysis, regularization methods, change point detection, network analysis, martingales, statistical genetics, personalized medicine, functional data analysis, neuroimaging data analysis, and statistical consulting.

The 2014 Spring Colloquium Series is in progress, featuring some outstanding speakers (listed at right). Twelve regular seminar talks have been scheduled covering a wide variety of topics from design of experiments to variable and treatment selection, to sports statistics, to genetic studies of complex traits.

Besides the regular Colloquium Series, the department hosted the UGA-Clemson Joint Seminar in April featuring the distinguished



Colloquium speaker, Dr. Richard De Veaux, with students and faculty after his Colloquium talk

speaker Kathryn Chaloner from the University of Iowa. Later in April, the department and the graduate student Stat Club co-sponsored the annual Bradley Lecture in honor of the late Professor Ralph A. Bradley. Our distinguished speaker this year was C.F. Jeff Wu, Professor and Coca-Cola Chair in Engineering Statistics at the School of Industrial and Systems Engineering, Georgia Institute of Technology. Dr. Wu gave research and after-dinner talks and interacted with our faculty and graduate students. The Stat Club also continued our tradition of hosting a picnic on the Saturday following the Bradley Lecture. The Bradley Lecture and departmental picnic are great events to draw you back to Athens. We hope you will consider visiting next year's

Bradley Lecture to be given by Dr. Susan Murphy on April 24, 2015.

To keep up with our Colloquium Series, we encourage you to visit our website where you will find full details for all talks in the series including their scheduling, titles, abstracts, and links to the speakers' webpages at their home institutions.

Our Colloquium Series events enhance the educational experience of our students, provide research opportunities for our faculty, and enrich the academic environment of the department. If you would like to support the University of Georgia Department of Statistics, please take a moment to show your support at the link below.

<u>Colloquium Series Website</u> <u>www.stat.uga.edu/events/colloquia/upcoming</u> Support the Department www.stat.uga.edu/giving



Dr. Snehalata Huzurbazar gives a colloquium talk on "Statistical Issues in the Inference of Timing of Gene Duplications"

# COLLOQUIUM SPEAKERS 2013-2014

#### **FALL 2013**

Eric Vance Virginia Tech

Xiaotong Shen

University of Minnesota

Yao Xie

Georgia Institute of Technology

Eric Kolaczyk

Boston University

Chris McMahan

Clemson University

**Sun-Young Hwang** 

Sookmyung Women's University

Heping Zhang Yale University

Tianxi Cai

Harvard University

narvard Universit

Jianhua Hu

The University of Texas MD Anderson Cancer Center

**Donglin Zeng** 

University of North Carolina Chapel Hill

**Guanqun Cao** 

Auburn University

**Chunming Zhang** 

University of Wisconsin

Runze Li Penn State

#### SPRING 2014

Rui Song

North Carolina State University

Joyee Ghosh

University of Iowa

Jason Kao

Arizona State University

Richard De Veaux

Williams College

**Zhou Yu**East China Normal University

Min Yang

The University of Illinois at Chicago

Peihua Qiu

University of Florida

Snehalata Huzurbazar

SAMSI, University of Wyoming and North Carolina State University

Yijuan Hu

**Emory University** 

R. Todd Ogden Columbia University

Kathryn Chaloner

University of Iowa

C.F. Jeff Wu

Georgia Institute of Technology

# CONSULTING CENTER UPDATE

Kim Love-Myers | Associate Director

The Statistical Consulting Center (SCC) has continued to grow over the past year under the leadership of Director Dr. Jaxk Reeves and Associate Director Dr. Kim Love-Myers. During the 2013-2014 academic year, the SCC has provided consulting assistantships for ten graduate students from the Department of Statistics: Yi Chen, Hsien-Lin Hsieh, Hejiao Hu, Lina Liao, Fei Liu, Xijue Tan, Guannan Wang, Wenbo Wu, Nan Zhang, and Yuan Zhuang. This support is possible through the SCC's ongoing relationships with the Franklin College of Arts and Sciences, the Graduate School, and the Office for the Vice President of Research, in addition to the income earned through SCC projects. These students, along with thirteen graduate and two undergraduate volunteer consultants, have made strong contributions to research efforts at UGA and beyond.

Of particular note are continued collaborations with several long-term commercial clients, a second major contract with Environment Canada, and a consistent client base from the Franklin College of Arts and Sciences, the College of Agricultural and Environmental Sciences, the Warnell School of Forestry and Natural Resources, the College of Family and Consumer Sciences, the Odum School of Ecology, and the College of Veterinary Medicine.

This year, the SCC has particularly emphasized the training and growth of our students as independent collaborators, with periodic videotape review of consulting sessions. Student consultants now serve as both lead and associate consultants in meetings with clients, under the mentorship of the associate director and director. This has increased both the efficiency of the SCC and the value of the consulting



Associate Director Dr. Kim Love-Myers and student Consulting Assistants review a case

experience to our students and clients.

Additionally, Dr. Reeves and consulting assistants Yuan Zhuang and Guannan Wang have led the efforts of a new Big Data focus group to help our consultants learn about this current and exciting area of application in the field of statistics.

The Director and Associate Director now have bi-weekly video meetings with the administrators of statistical consulting centers at seven other US land-grant universities, which operate similarly to ours. Through these interactions, we have been able to learn what others in the field are doing and

inform them of what we have found to be useful. In addition to this increase in the national visibility of the SCC, Dr. Love-Myers is honored to have been named the 2015 program chair of the Statistical Consulting Section of the American Statistical Association.

The SCC once again anticipates additional growth in the coming year in all three areas of its mission, including making statistical support available to UGA researchers, increasing the quality of quantitative research at the University, and providing valuable educational experience and training to graduate students in the Department of Statistics.

#### STAT CLUB UPDATE

Munir Winkel | STAT Club President

Dear People of Statistics,

What has a mean of zero and a standard deviation of zero? If you guessed "Statistics Club dues this year," then you are correct. Nobody paid dues this year due to a surplus in the budget as a result of Wenbo Wu, the previous Statistics Club President, and his responsible financial management.

During the first few weeks of fall 2013, our team of officers focused on expanding the role of the club to include more opportunities for networking, community building within the department, and providing important information for graduate students.

Faculty and students came together during the International Potluck Dinner and our Ice Cream Social. Dr. John Stufken, our department head, met with current graduate students in order to discuss the strengths of the program as well as suggestions for improvement.

Later in the year, we gathered downtown for a few evenings of beverages and socialization. As 2013 transformed into 2014, PhD students were wooed and friendships grew.



Yaotong Cai and STAT Club President, Munir Winkel, at dinner with prospective students



Statistics students at Teds Most Best for the prospective student dinner organized by the STAT Club

As part of a joint sponsorship between the UGA Department of Statistics and the Statistics Club, we organized the 22<sup>nd</sup> annual Bradley Lecture, featuring Dr. C.F. Jeff Wu. He spoke to a crowd of graduate students, faculty members, and honored guests in the beautiful setting of the State Botanical Gardens. Shortly afterwards, we enjoyed the refreshing April weather during the Spring Picnic, held this year at Lake Herrick.

In the coming years, we hope to create more networking opportunities for our graduate students, continue to build a sense of community, and provide valuable career skills for our students.

On behalf of all the officers of the Statistics Club, it has been our honor to serve you.

## STAFF PROFILE: MEGAN WEATHERFORD

Following a search to replace Julie Davis, Megan was offered the Department's Administrative Associate position. She joined us in May of 2013, leaving her position at the Veterinary Teaching Hospital. Megan grew up in Claxton, GA, and graduated valedictorian of her high school. She studied abroad in Brazil and graduated Cum Laude from the University of Georgia in 2008 with a bachelor's degree in Romance Languages (Portuguese and Spanish). Megan's past experiences include teaching English as a Second Language, customer service, and medical office management. In her free time, Megan enjoys time with her husband Joe, cooking, hiking, visiting the beach, reading, and



learning about other cultures and languages. She has two lovable dogs named Archie and Dooley. Megan has proven to be an excellent hire for the department, and couples high quality contributions with an outstanding work ethic. She continues the trend of providing excellent service and crucial support to our department! Drop her a note to say hello. Her email address is megantw@uga.edu.

Timothy Cheek, Business Manager

# STAT 4110H APPLIED HONORS STATISTICS

T.N. Sriram / Professor

This second Honors statistics course has been taught and developed by Professor Christine Franklin over the past 25 years. It gives a rigorous treatment of what is typically covered in an introductory statistics course and introduces students to an array of specialized topics while emphasizing real data analysis and communication skills. This semester, I introduced R as the primary software for computing, data analysis and graphics in this course. R is a free software environment, which has emerged as a powerful alternative to many other traditional softwares. Besides the convenience of using R from home when completing assignments, the knowledge of **R** is providing Honors students a competitive edge in today's job market and academic research. Realizing that the ultimate goal is

to promote statistical thinking and that R requires a steep learning curve, I developed topic-oriented lab notes that give step-by-step instructions on how to use  $\vec{R}$  to carry out data analysis. In addition, I have developed R lab materials that provide a hands-on approach to understanding subtle concepts, such as, randomness, probability models, Central Limit Theorem, confidence intervals and power functions, among others. Within the first 5 weeks, students adapted to using R for the assignments and exams. I am currently directing five or six major group projects involving a wide range of topics from the Vietnam War to Major League Baseball. Students will be making poster presentations of their projects in the Cohen Room at the end of the semester.

# NEW EXTERNALLY FUNDED GRANT PROJECTS IN THE DEPARTMENT OF STATISTICS

#### Jennifer Kaplan, Assistant Professor, PI

NSF, "Collaborative research: Expanding a national network for automated analysis of constructed response assessments to reveal student thinking"

Constructed response (CR) assessments, for which students write a narrative response, provide greater insight into student thinking than closed form (e.g., multiple-choice) assessments. In the past, financial and time constraints made CR assessments significantly more challenging to execute than multiple-choice assessments in large-enrollment courses. The Automated Analysis of CR (AACR) project capitalizes on recent advances in both technology

and measurement research to apply these techniques in large-enrollment instructional settings. Dr. Kaplan and her supported graduate students are creating CR assessments and the associated computer scoring models that can be used in a course such as STAT 2000 to provide feedback to instructors about student learning that can be used to modify instruction to promote deeper understanding of statistics.

# Nicole Lazar, Professor, PI

NIH, Subcontract from SUNY, "Analysis for incomplete data in oral health/ventilator associated pneumonia study"

In this project we use empirical likelihood (EL) methods, which are nonparametric analogues of standard likelihood tests. This technique has many advantages: it is robust and data-driven, so inference is guided by the characteristics of the data.

We explore different ways of defining the EL function and using the information available in subsamples, which is particularly useful when there are missing data, as well as when there is dependence between observations.

#### Ping Ma, Associate Professor, PI

- NSF, "CAREER: Subsampling methods in statistical modeling of ultra-large sample geophysics"
- NSF, "Collaborative research: ATD: Integrated statistical algorithms with ultra-high performance computing for discovering SNPs from massive nextgeneration metagenomic sequencing data"
- 1. Remote sensing of the Earth's deep interior is challenging. Direct sampling of the Earth's deep interior is impossible due to the extreme pressures and temperatures. Our knowledge of the Earth's deep interior is thus pieced together from a range of surface observations. The investigator will establish asymptotic and finite sample theory to investigate the approximation accuracy and consistency of the proposed methods. The theory to be established will benefit a wide spectrum of research in science and engineering. They will offer a unique educational experience for both undergraduate and graduate students to participate in cutting-edge statistical and interdisciplinary research and inspire new lines of researches in three distinct fields: statistics, geophysics, and

computational biology.

2. Recently, the emerging new field of metagenomics facilitated by the advent of next-generation sequencing technology enables genome sequencing of unculturable and often unknown microbes in natural environments, offering researchers an unprecedented opportunity to delineate bio-diversity of any microbial organism. The proposed project provides the national security and biodefense agencies new tools for rapid and accurate detection of biothreat agents. It also provides researchers in microbiology with new tools for producing abundant, high throughput SNPs for detailed analysis of the genetic basis of microbial diversity and evolution.

# Abhyuday Mandal, Associate Professor, PI

NSA, "Collaborative research: Optimal design of experiments for binary response"

Generalized linear models (GLMs) have been used widely for modeling the mean response both for discrete and continuous random variables with an emphasis on categorical (mostly binary) response. Optimal allocation of runs in replicated design of experiments is an intellectually challenging and very important practical problem. This research will address this question in the context of several optimality criteria, namely Doptimality, EW-optimality and

Bayesian optimality. We obtain theoretical results and develop algorithms for obtaining locally optimal designs, which can improve the precision of estimates for a specified sample size. While research on optimal designs for linear models has been systematically developed over several decades, there are relatively fewer research publications on optimal designs for GLMs. The proposed project will address this void.

#### Paul Schliekelman, Associate Professor, Co-PI

DOE, "Unraveling the genetics of two key biomass traits that differentiate upland and lowland tetraploid switchgrass ecotypes, colonization by mycorrhizal fungi and frost tolerance"

The goal of this project is to determine the genetic architecture of frost tolerance in switchgrass. Switchgrass is promising for use in bioenergy production. However, the varieties that produce the highest biomass have low frost tolerance and do poorly at more northern latitudes. Knowledge of the genetic factors determining frost

tolerance will assist in the development of switchgrass strains that both produce high biomass and can survive in colder climates. My role in the project will be to lead the analysis of the genetic data in order to understand the relationship between genetic variation and variation in frost tolerance.

#### T.N. Sriram, Professor, PI

NSF, "Collaborative research: Renyi divergence-based robust inference in regression, time series, and association studies"

A typical characteristic of many contemporary datasets is that they are relatively high-dimensional in nature. This has prompted a shift in the applied sciences toward a divergent relationship-study genre arising in regression, time series and multivariate association, popularly known as dimension reduction, whose goal is to reduce the dimensionality of the variables as a first phase in the data analysis. However, the presence of outliers in high-dimensional datasets adversely affects the performance of existing dimension reduction methodologies, resulting in conclusions that are not completely reliable. Given

that outliers are commonly encountered in high-dimensional datasets and that their presence is hard to detect, there is an urgent need to identify dimension reduction methods that possess some degree of automatic robustness, or nonsensitivity, to outliers. The proposed project provides robust dimension reduction methods, which would pave a new research path in dimension reduction and contribute significantly to the analysis of high-dimensional data arising in fields such as the social sciences, machine learning, sports, economics, environmental studies, morphometrics and cancer studies, among others.

#### Lily Wang, Associate Professor, PI

NSF, "Statistical inference for functional data in time series and survey sampling: theory and methods"

Sophisticated data collection facilities often produce data which are a set of functions, represented in the form of curves, images or shapes. The development of functional data analysis in theory and methodology has provided us important analytical tools to address challenging problems encountered in many important fields. This project targets the development of

powerful statistical tools for analyzing functional data in time series and survey sampling frameworks. The success of the project provides effective and practical tools for dealing with large and complex structural data over time and space, representing advances in the theory and methodology of statistical analysis..

#### Wenxuan Zhong, Associate Professor, PI

- NSF, "Collaborative research: Leverage subsampling for regression and dimension reduction"
- NSF, "ATD Collaborative research: Statistical modeling of short-read counts in RNA-Seq"
- 1. As a result of rapid advances in information technology, massive datasets are being generated in all fields of science, engineering, social science, business, and government. Useful information is often extracted from these data through statistical model fitting, e.g., through regression models. These models are useful for describing relationships between predictor variables and a response variable. The investigators consider both statistical theory as well as the evaluation of that theory with highquality numerical implementations on large real-world data.
- 2. Rapid and accurate detection of biothreat is important not only for containing its potential damages, but also for determining potential medical remedies. In this project, the investigator and her colleagues will tackle this problem by modeling RNA-Seq data through a broad class of flexible nonlinear models, called sufficient dimension reduction (SDR) models; propose novel variable selection methods for SDR models; and develop theoretical underpinning of the effectiveness of the proposed methods.

# 2014 EDUCATION AND OUTREACH UNDERGRADUATE WORKSHOP AT SAMSI

Andrew Kane | Economics & Statistics Student



Students in front of SAMSI during the 2014 workshop

The 2014 workshop hosted by the Statistical and Mathematical Sciences Institute (SAMSI) gave me a fascinating and approachable overview of cutting-edge topics in statistics. Organized by Dr. Snehalata Huzurbazar, the February workshop introduced undergraduates to leaders of various fields of statistics whose love of research was infectious: in 40-minute

professors delved into topics from randomization for query searches, to the applications of topology, to evolutionary biology. SAMSI's post-docs also gave valuable advice to students seeking a graduate degree in statistics by explaining which fields' experts are most in demand and what to expect in a PhD program. The workshop was a fun, valuable introduction to statistical research.



University of Georgia Statistics students Andrew Kane and Samantha Cao with Dr. Huzurbazar and her daughter

# Joint Statistical Meetings (JSM) 2013

The Joint Statistical Meetings (JSM) is the largest gathering of statisticians held in North America and is attended annually by more than 6,000 people.

This year, the International Year of Statistics was celebrated at JSM and many of our faculty and students traveled to Montreal, Canada to take advantage of the technical sessions given by well-known statisticians. JSM also offered many networking opportunities and a career fair for students to interface with potential future employers.

Though far from home, faculty, students and alumni met at Chez Delmo, to continue our tradition of gathering for dinner during the conference. Next year's Joint Statistical Meetings will be held in Boston, Massachusetts. We hope to see you there!



Professor Christine Franklin with family and friends in front of the Palais des Congress de Montréal

# INTERNATIONAL WORKSHOP IN SEQUENTIAL METHODOLOGIES (IWSM) 2013

T.N. Sriram | Professor

PowerPoints, visiting

I hosted and co-organized the "Fourth International Workshop in Sequential Methodologies (IWSM 2013): at the UGA Georgia Center from July 18-21, 2013. The IWSM 2013 is a continuation of the previous three highly successful workshops, which took place in Auburn University (2007), University of Technology of Troyes, France (2009), and Stanford University (2011). The goal of the workshop was to bring together researchers and practitioners from all areas within sequential methodologies. Franklin College Dean Alan Dorsey and Professor John Stufken gave the inaugural address at the workshop. About 90 invited participants from all over the world attended the workshop, of which four presented plenary talks and the rest presented invited talks on a variety of topics related to sequential methodologies.

The plenary speakers and many young researchers, including several graduate students, were partially supported using financial support from the Office of the Vice President for Research, President's Office, Graduate School, Franklin College, Research Development Committee in Statistics, and Aptiv Solutions.

Dr. Abhyuday Mandal played a critical role in organizing and coordinating the workshop. The statistics graduate students along with Mr. Tim Cheek, and Mrs. Megan Weatherford provided immense help to make the workshop a highly successful event.

# CONFERENCE REGISTRATION



Statisticians from around the world socialize over dinner



Dr. Steve Coad presents on "Estimation of Parameters of the Absolute Autoregressive Model" as part of the first plenary session



Renowned statistician, Dr. Shelemyahu Zacks and his wife after blowing out



IWSM Organizer, Dr. T.N. Sriram; co-organizer, Dr. Abhyuday Mandal; and student volunteers

# CONFERENCE NEWS 2013-2014 (continued)

# 2014 UGA/CLEMSON JOINT SEMINAR

Since the 1970's, statisticians from the University of Georgia Department of Statistics and the Clemson University Mathematical Sciences Department have organized the annual UGA/Clemson Joint Seminar. Each year, the venue alternates between Athens and Clemson with an outstanding speaker invited to present on a topic of their choice.

This year, the event was held at the Georgia Center on Thursday April 17, 2014. We had the pleasure of hosting Dr. Kathryn Chaloner, Professor and Head of the University of Iowa's Department of Biostatistics. Her research interests include clinical

trials, Bayesian Statistics, experimental design, HIV/aids research and viral dynamics. Dr. Chaloner's talk, "Bayesian Methods for Study Design and Statistical Analysis," discussed the use of Bayesian methods to facilitate a wide range of scientific advances and focused on real-world examples including the Haemophilus influenza inoculation.

After the talk, conference attendees enjoyed dinner in the Georgia Center's Magnolia Ballroom where they had the opportunity to interact with Dr. Chaloner and to network amongst each other.



Dr. Kathryn Chaloner as she discusses "Bayesian Methods for Study Design and Statistical Analysis"



Dr. John Stufken, Dr. Abhyuday Mandal and Dr. Kathryn Chaloner before the UGA/Clemson Joint Seminar begins



UGA and Clemson conference attendees during the talk



Students Vineet Vora, Adrijo Chakraborty, Haileab Hilafu and Yaser Samadi at dinner after the seminar

# 2014 CAPSTONE POSTER PRESENTATIONS

The Statistical Capstone Course STAT 5020 is part of a year-long sequence beginning with STAT 5010 in the fall. The statistics capstone course provides students with an exposure to advanced statistical methods, beyond regression and analysis of variance, and introduces the student to a data-analysis experience related to a real scientific problem. In addition to learning and applying statistical techniques, effective oral and written communication of methods and results are emphasized.

Before the start of the fall semester, professors Nicole Lazar and Lily Wang reach out to prospective clients who have realworld problems that students may





University faculty, students and clients interviewing capstone students about their projects evaluate using statistical methods discussed in class.

There is no cost to the client and students have the opportunity for hands-on experience. Often, the projects are so successful, that clients volunteer for future classes. Once clients have agreed to participate, they present their issue to the class. Students then submit bids to work with a client and are assigned a project based on these preferences. This year, topics ranged from Discrimination in the Workplace, to Bacterial Vaginosis, to UGA Library Stack Study.

With the semester coming to a close, students presented their research and findings at the



Dean Baraso, Nathain Karner, and Sam Hempel in front of their poster analyzing weather forecasts

Capstone Poster Session in the Cohen Room. Department of Statistics faculty and students along with project clients were invited to interview each group. This course provides students with invaluable experience that many include on their resumes upon graduating.





Professor T.N. Sriram interviews students Ben Washington, Matthew Alexander and Daniel Bailey about their UGA Library Stack Study



Professors Nicole Lazar and Lily Wang [right] with their capstone students after the poster session

#### THE NEW COHEN ROOM



Business Manager Tim Cheek [right] showcases his hard work to Professor T.N. Sriram [left]

Since 1984, the Department of Statistics has been located within the STAT/Computer Services building at the corner of East Campus Road and Cedar Street. The building was formerly used by the Physical Plant Division and housed various kinds of grounds equipment before being converted into academic offices and classrooms.

The Cohen Room was named for Dr. A. Clifford Cohen who first became part of the department in 1947 and who greatly influenced the department's development. Before the renovation, the Cohen Room was a central gathering place for students and faculty. It was a large, open room lined with bookshelves and filled with tables and chairs where members of the department often met to have lunch, to study in small groups, and to meet for departmental events.

After nearly 30 years in the same location, however, the department's

growth highlighted the need for renovation. With the arrival of two new faculty members, Dr. Wenxuan Zhong and Dr. Ping Ma, the former conference room was converted into two faculty offices. With no further room to grow, it then became necessary to recreate the Cohen Room as a multi-purpose space.

In 2013, Business Manager Tim Cheek directed the complete renovation of the Cohen Room. Although most of the funding came from student fees, a significant amount was allotted from The Cohen Fund, which was set up through a generous donation in honor of Dr. Clifford Cohen for the maintenance and renovation of the Cohen Room. In addition, the renovation was made possible through the invaluable assistance of the department's staff members, Julie Davis and Daphney Smith. Our sincerest gratitude also goes out to the Facilities Management Division and Meagan Strong of Fowlers Office Interiors. In August 2013, faculty, staff, students, and friends of the department celebrated the newly renovated Cohen Room at the ice cream social to kick off the new academic

The Cohen Room, now The Clifford Cohen Conference and Study Area, is still the central meeting point for the department and is available primarily as a student study area when not in use for meetings. As before, there is a small kitchen area separated from the conference room so that students may



Students socialize in the old Cohen Room

still study or enjoy lunch even while a meeting is in session. The kitchen area is also the central point for serving refreshments during colloquia events as well as housing the popular water and coffee machines.

Through the vision and efforts of staff, the new Cohen spaces have become the crown jewel of the department's physical space. Thanks to the Cohen Fund and funding from Franklin College, the spaces are now equipped with the latest in conference room technology. This technology includes a new projector system, a larger projector screen, presentation podium, electronic system controls, and web camera capability. Members of the department are now able to stream presentations on the internet, host meetings of up to 30 people, and video conference with others around campus, the country, and the world.

Beyond new technological capabilities, the Clifford Cohen Conference and Study Area now offers a more



Refreshments served in the old Cohen Room



Former staff member Julie Davis as she returns to the department to see the completed Cohen Room for the first time

professional, multi-use space for studying, meetings, and events. It is truly a point of pride for the department. We welcome our alumni and friends to visit us and enjoy this new addition!



The department name over the doors inside the new Cohen Room conference area



 ${\it View from the speaker's podium of the new conference table and Dr.\ Cohen's portrait}$ 



Dr. A. Clifford Cohen around the time he first began to shape the Department of Statistics



The new kitchen area



View of the Clifford Cohen Conference and Study Area from the new kitchen space



Student study area in the kitchen

# COURSE PROFILE: STAT 4220 APPLIED EXPERIMENTAL DESIGNS

Samantha Cao | Statistics & Public Health Student In Dr. Mandal's STAT4220 Experimental Design class for fall semester 2013, we conducted an experiment as a final project for our class. We had to incorporate the knowledge we gained from the course into creating a statistically well-designed experiment using a catapult

used a catapult provided by the statistics department in order to conduct our experiments.

The primary goal of the experiment was to determine the factors that affect the distance a ball travels after being launched by a catapult apparatus. The catapult contained various adjustable factors that may or

may not affect the launch distance: launch arm length, ball type, stop angle, anchor height, and catapult height. Through statistical analyses and diagnostics, the experiment aimed to determine the significance of each factor and interaction effects as it relates to launch distance.



Students watch as the first ball is launched



Samantha and her fellow students listen as Dr Mandal explains the project objective

# INAUGURAL BEST CAPSTONE STUDENT 2013

As a 5<sup>th</sup> year senior from Dublin, Georgia, William Thomas Purvis, was honored to be the inaugural recipient of the Kermit Hutcheson Best Capstone Student Award in 2013. This award is possible through the generous gift of Professor Emeritus Kermit Hutcheson who wishes to support the undergraduate program in statistics.

Thomas double majored in mathematics and statistics, and has always been intrigued by accuracy and appreciates the "security in numbers." Working with numbers has always come easily to him; however, it wasn't until he took two statistics courses taught by Dr. Jeongyoun Ahn that he decided to pursue education in Statistics. He describes her as the teacher most influential in guiding him toward a career in Statistics.

Thomas enjoys the Property/Casualty side of actuarial statistics, model building to make predictions and is particularly fond of the Central Limit Theorem. He graduated in December 2013, after which he accepted an actuarial position with Liberty Mutual in Boston. His long-term career goal is to maintain a career as an actuary and to become a fellow of the Casualty Actuarial Society (CAS).

Offering the student's perspective, Thomas says that most Statistics courses provide students with a theoretical knowledge and teach students to



work problems repeatedly. The Capstone Course is different in that it allows students the opportunity to apply that theoretical knowledge before beginning their career. Through the Capstone Course, Thomas worked with two other students to collaborate with the UGA chemistry department's Complex Carbohydrate Research Center. They applied statistical analysis to discover the most common shapes made by sucrose molecules.

Beyond applying Statistics in a hands-on setting, one of the biggest benefits of the Capstone Course for Thomas was having this experience on his resume. He feels that having this edge was definitely noticed by potential employers. Without a doubt, Thomas recommends the Capstone Course to other students.

Christine Franklin, Undergraduate Coordinator, describes Thomas as an outstanding selection for the inaugural recipient of the Best Capstone Student Award. As she noted in the presentation of the award on May 10, 2013, Thomas exemplified the criteria for the award: Consistently demonstrating throughout the year dedication to the capstone philosophy of seeing the big picture of statistical analysis; embracing the importance of writing, communication, and research skills; a strong work ethic; stepping up to provide leadership and also being a team player; and demonstrating professionalism within the class and working with their group's client. We are proud of Thomas's accomplishments. He sets a high standard for the future winners of this award.

# STUDENT AWARDS

#### Allison Moore

Best Master's Student

#### **Debin Qiu**

Best Beginning PhD Student

#### Haileab Hilafu and Linwei Hu

**Best Senior Students** 

#### Yuan Zhuang

Best Student Consultant

Haileab Hilafu, Linwei Hu, Fei Liu, Ling Liu, Qianqian Ma, Zhengbo Ma, Ting Meng, and Zhen Yan

Graduate Mu Sigma Rho Inductees

Glenn Branscomb, Xian Cheng, Jerry Griffin, Ting Ting Huang, Danielle Ledon, Onkar Medhekar, Matthew Passarello, Hao Peng, Thomas Purvis, Christopher Rink, Candace Rushing, Stewart Zellars

Undergraduate Mu Sigma Rho Inductees

#### **Thomas Purvis**

Inaugural Best Capstone Student Award



#### Stephen Morris, Alexander Lyford, Kyle Jennings and Mohamad Hasan

Outstanding Graduate Teaching Assistant Awards

#### Sha Cao and Guannan Wang

2014 Innovative and Interdisciplinary Research Grant (IIRG)

# 2014 INNOVATIVE AND INTERDISCIPLINARY RESEARCH GRANT (IIRG)





We are excited to extend congratulations to Sha Cao (Ph.D. candidate, UGA Computational Systems Biology Lab and Department of Statistics) and Guannan Wang (Ph.D. candidate, UGA Department of Statistics) who were each awarded a 2014 Innovative and Interdisciplinary Research Grant (IIRG). This is a highly competitive award established by the Graduate School as part of its strategic initiative to support innovation and interdisciplinarity in the research being conducted by doctoral students. IIRG recipients are awarded up to \$1,000 to assist in their research endeavors over the summer.

# WELCOME NEW FACES!

## STAFF:



This year, we welcomed Brett Johns to the department as our new IT Professional. Brett comes to us from Canton, Georgia. He has been at UGA in some capacity, either as a student or an employee, since moving to Athens in 2007. Brett graduated from UGA with a bachelor's degree in Political Science and is currently studying for his master's degree in Internet Technology.

Outside of IT, Brett enjoys being a politically active member of the community and spends most Saturdays keeping up with college football

# FACULTY:



Dr. Ping Ma. Associate Professor



Dr. Wenxuan Zhong, Associate Professor

This year, we welcomed two new faculty members: Dr. Ping Ma and Dr. Wenxuan Zhong. Coming to our department from the University of Illinois at Urbana-Champaign, they each offer a plethora of experience including doctoral degrees from Purdue University and serving as Postdoctoral Fellows at Harvard University.

Dr. Zhong, whose interests include computational biology, bioinformatics and variable selection, joined our department as a tenure track Associate Professor while Dr. Ma joined us as an Adjunct Associate Professor and transitioned to Associate Professor in January 2014. His research interests include bioinformatics, functional data analysis and geophysics.

Outside the department, they enjoy spending time with their son and daughter. Dr. Ma also enjoys reading Chinese novels and collects stamps from the United States and China.



#### ALUMNI UPDATES

#### **Jeff Anderson**

B.S. | 2011

Currently pursuing a joint JD/MBA at Georgia State University.

# Ravija Badarinathi

Ph.D. | 1983

I am the chair of Information Systems and Operations Management but will step down on July 1.

#### **Monica Smith Daniel**

B.S. | 1999

I am currently working as a Senior Operations Analyst in Business Analytics for Aflac. My degree has afforded me the opportunity to work as an Affirmative Action/EEO Specialist as well as my current position.

#### Abigail Deel

B.S. | 2013

I have been working odd jobs for the past year saving up money. I am applying to MBA programs starting in the fall.

#### **Emily Fancher**

M.S. | 2013

I'm working as a Risk Analyst for Assurant Solutions in Atlanta, GA.

#### Jessi Fawley

B.S. | 2011

Jessi works as a risk analyst for First Data and loves her job! She is also serving as the president of the Houston, TX UGA alumni chapter.

#### **Corey Green**

B.S. | 2010

I am currently completing an MS in Forestry with an emphasis on forest biometrics.

#### R. Russell Helm

Ph.D. | 1970

After 41 years in higher education, I retired from my position as CIO for the University of Central Missouri in 2010 where I had served since 1996. This was after holding teaching and administrative positions at 6 other institutions including my undergraduate institution, the University of Arkansas, along with The Medical College of Wisconsin and the statewide higher education system of South Dakota. The PhD from the UGA has allowed me to pursue my many interests throughout my career, both in teaching(statistics, mathematics, and computer science) and administrative roles in both the academic and technology areas. I am very grateful to the UGA and the Department of Statistics for these opportunities. My wife Jan and I have retired to southern Colorado and are enjoying all this area has to offer as well as traveling extensively. I am also actively involved in the local community including helping math and science students in the local high school both with tutoring and by substituting in their math department.

#### Kathleen Blalock Higley

M.S. | 1987

Currently living in Houston, TX. Strategy Manager with Shell Oil. Married with three children.

#### **Paul Hofmann**

B.S. | 1995

I continue to work as a Senior Statistical Programmer/Analyst at Duke Clinical Research Institute, in Durham, North Carolina. This past year, my primary focus has been clinical trials and manuscript work over many different therapeutic areas.

#### Jeremiah Johnson

M.S. | 2012

Located in New York City, working as a statistical consultant on analytics/Big Data projects for Ernst & Young.

Alumni updates continued on page 11...

# ALUMNI UPDATES (continued)

## Marilyn Kempe

B.A. | 2004

I received my Masters in Biostatistics at University of Maryland Baltimore County (UMBC) in 2007 and have been working at the US Census Bureau since 2006 as a mathematical statistician. I got married in 2006 to Stephen Balogh and have 3 children Elizabeth, Alexander, and Audrey.

#### **Austin Layton**

B.S. | 2013

Currently am the Program Manager for the University of Michigan's Debate Team and living in Ann Arbor, Michigan.

#### Mike McGill

M.S. | 2003

I received my PhD in Educational Research and Evaluation from Virginia Tech in 2009. Currently I am the Statistician for Advanc-Ed in Alpharetta GA.

# Harji Patel

M.S. | 1969

I retired in 2003 from my last job of teaching Biostatistics at Georgia Southern University. Prior to this I worked as a biostatistician for the various pharmaceutical companies in New Jersey, mainly in the field of clinical trials. During retirement, I spend most of my time in spiritual activities and try to remain healthy. All our children are independent and have their families.

#### **Darryl Revenew**

M.S. | 1990

Transitioning from Sales Director in the Technology industry to Academia in software (JMP from SAS).

# **Christopher Rink**

B.S. | 2013

I graduated from the Statistics BS program in May of 2013. I moved up to Madison, Wisconsin in July and started working as Business Intelligence Developer for Epic (the electronic medical record vendor). The end of 2013 and beginning of 2014 have been filled with plenty of interesting and new challenges. Working for Epic presents with new experiences and problems every day which I am forced to think creatively to solve. Additionally, having grown up in warm summer climes, I have had to adapt to the harsh, snowy winters in Wisconsin in a pinch. Still, it's been a fun many months and I look forward to many more. I'm missing UGA and Athens greatly, but I'll come back to visit from time to time as my schedule allows.

We invite all of our alumni to keep in touch! Let us know how you are doing by submitting an alumni update form on our website at:

http://www.stat.uga.edu/alumni-update-form

# ALUMNI PROFILE

Ming-Hung (Jason) Kao / Ph.D. 2009



"My training and experience at UGA have been very important resources for me to face new challenges."

Before coming to UGA, I earned a Bachelor's degree in mathematics, and a Master's degree in Statistics from National Central University in Taiwan. Under the direction of Professor Shui-Ing Liu, I have completed an M.S. thesis, titled "Bayesian Analysis for Multiple Changes of the Long Memory Parameter," on studying long-memory time series with multiple unknown change points via a Bayesian approach. I also worked in a contract research organization (CRO) on design and analysis of clinical trials. I have always been and continue to be enthusiastic about studying statistics and applying what I have learned to real-world experience.

At UGA, there is a wide variety of scholarly activity, offering much opportunity for young scholars and students to learn and grow. I was lucky to study in the statistics department.

During my time there, I completed many different research projects, was involved in consulting, and gained teaching experience. I also joined the functional magnetic resonance imaging (fMRI) data analysis study group led by Professor Nicole Lazar to study research ideas on this new emerging line of statistical research with other students and faculty members from statistics, mathematics, and psychology. This research line turned out to be an important integral part of my dissertation research, which is on design of experiments for fMRI studies. With very helpful guidance from my major advisors, Professors John Stufken and Abhyuday Mandal, my dissertation research has since won me the James L. Carmon Scholarship from the Office of the Vice President for Research at UGA, and a student paper award from the Statistical Computing Section and the Statistical Graphics Section of the American Statistical

My training and experience at UGA have been very important resources for me to face new challenges.

Currently, I am working with the School of Mathematical and Statistical Sciences at Arizona State University. As an assistant professor in statistics, I continue to enjoy teaching practical statistical knowledge and skills, and conducting research to make important contributions to the society. My recently funded NSF CAREER grant provides a wonderful jump start for me to continue to expand my research, and incorporate my research results into education to inspire younger minds. These are two integral parts of my career goal.

# MARK YOUR CALENDARS:

We would love to see you soon! Stay tuned for future event information by visiting our website:

www.stat.uga.edu

- > JOINT STATISTICAL MEETINGS (JSM) 2014 August 2-7, 2014 Boston, Massachusetts
- BRADLEY LECTURE 2015
   Friday, April 24, 2015
   Athens, Georgia
- > DEPARTMENT OF STATISTICS FALL 2014 COLLOQUIUM SERIES Begins Thursday August 21, 2014 Athens, Georgia

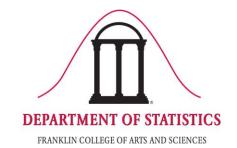
## STATISTICS NEWS SPRING 2014

brought to you by

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With special thanks to our contributors: Samantha Cao, Christine Franklin, Pengsheng Ji, Andrew Kane, Ming-Hung (Jason) Kao, Kim Love-Myers, Abhyuday Mandal, Cheolwoo Park, Lynne Seymour, T.N. Sriram, Lily Wang, Munir Winkel

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For more information about giving to the Department of Statistics, please contact the Franklin College Office of Development at (706) 542-4658.

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# THANK YOU!

We wish to acknowledge gifts from and extend a very special thank you to the following individuals and organizations that made a gift to the Department of Statistics over the last year:

Aptiv Solutions; Mr. Glenn R Branscomb; Dr. Jien Chen and Dr. Qin Wang; Eli Lilly and Co. Foundation; Ms. Tonya S. Freeman; Dr. Georgia Kim Gilbert; Mr. Jungchul Kang; Mrs. Sheredia D. Langhorne; Ms. Lauren R. Langhorne; Professor Tae Wook Lee; Dr. Stephen W. Looney and Ms. Teresa McVeigh; Dr. Wesley D. Love; Dr. Daniel Mayer; Mr. David P. Millard II; Ms. Elaine Neal; Dr. and Mrs. Harji I. Patel; Mr. and Mrs. Darrell J. Philpot; SDL Speech Therapy Services, LLC; Dr. Byeongchan Seong; Ms. Gabriele A. Tonsil; Unclaimed Property Consulting & Reporting LLC; Mr. Andrew J. Vesper; Mr. Stewart T. Zellars; Dr. Yong Zeng

