

# LISA (Laboratory for Interdisciplinary Statistical Analysis)



Collaboration



Walk-In Consulting

Statistical Short Courses



**2012-13 LISA Annual Report**  
**November 4, 2013**

[www.lisa.stat.vt.edu](http://www.lisa.stat.vt.edu)



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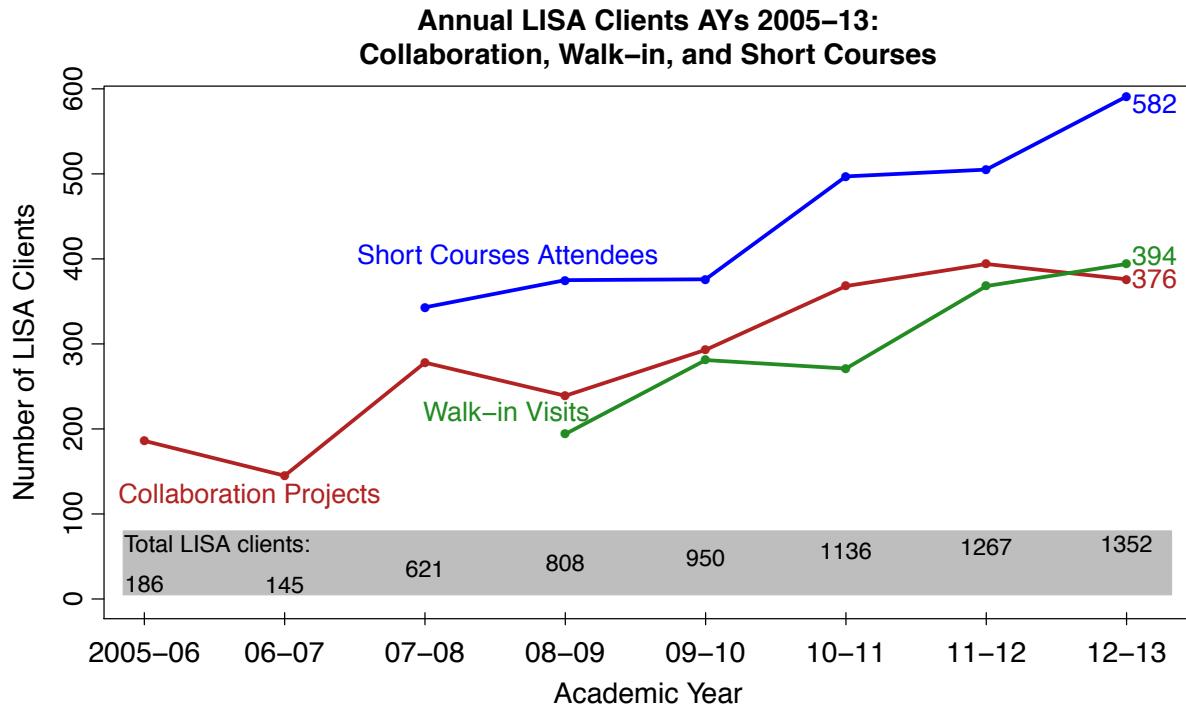
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## [2] Executive Summary

The 2012-13 academic year was very successful for LISA, Virginia Tech's Laboratory for Interdisciplinary Statistical Analysis. LISA statistical collaborators helped more researchers around Virginia Tech than ever before, **1352** in total for the three main services of Collaboration Meetings, Walk-in Consulting, and educational Short Courses (Figure 1).

Highlights of 2012-13:

- Vigorous emphasis on collaborations and co-authorships resulted in **18 peer-reviewed publications**, including a lead-authored paper in *PNAS* by LISA Lead Collaborator Jonathan Stallings; 30 conference posters and presentations; and an additional 13 manuscript submissions.
- Funded by a Google Research Award to LISA Director Dr. Eric Vance, Olawale Awe from Nigeria was selected from 108 applicants to be the first LISA Fellow in the growing LISA 2020 program to create a network of 20 statistical collaboration laboratories in developing countries by 2020.
- For the third year in a row, LISA was featured in an invited session at the American Statistical Association's (ASA) Joint Statistical Meetings (JSM). This year's invited session was "International Statistical Consulting: Current Initiatives to Build Statistics Capacity in Developing Countries."
- LISA Lead Collaborator Andy Hoegh was appointed StatCom Outreach Coordinator for the international StatCom network. He also won the Best Poster prize at JSM from the ASA's Section on Statistical Consulting (CNSL).
- Dr. Vance was elected chair-elect (and 2015 chair) of CNSL, became an elected member of the International Statistics Institute, and was appointed Vice Chair of Statistics Without Borders.



**Figure 1.** Annual number of LISA clients in academic years 2005-06 to 2012-13

# LISA Collaborators [3]

Dr. Eric Vance, Director

Dr. Christopher Franck, Assistant Director

Tonya Pruitt, Administrative Specialist

## Lead Collaborators

Jon Atwood  
Khaled Bedair  
William Tyler Bradley  
Marcos Carzolio  
Lulu Cheng

Andy Hoegh  
Qing Li  
Yiming Peng  
Liang (Sally) Shan  
Jonathan Stallings

Ana Maria Ortega Villa  
Ning Wang  
Liaosa Xu

## Associate Collaborators

Ahmad Alothman  
Jennifer Cheng  
Ho Cho  
Shuyu Chu  
Michelle Collura  
Amanda Coughlin  
Ian Crandell  
Liam Cryan  
Mingqian Dai  
Feng Du  
Zaili Fang  
Roberto Guzman-Franco  
Adam James

Caleb King  
Han Li  
Ying Li  
Yu (Ryan) Liang  
Yi Liu  
Hao Lu  
Wei Ma  
Emanuel Msemo  
John Mulheren  
Ashley Nelson  
Jing Niu  
Muliang Peng  
Sarah Richards

Xiaoyue Shu  
Jinhui Sun  
Peng Sun  
Amy Tillman  
Edwin Tsay  
Joshua Washburn  
Chaoping Xie  
Yimeng Xie  
Yi Xiong  
Zhibing (Alex) Xu  
Miao Yuan  
Angang Zhang  
Lin Zhang

## Statistics Faculty Collaborators

Dr. Xinwei Deng  
Dr. Pang Du  
Dr. Ina Hoeschele  
Dr. Yili Hong  
Dr. Inyoung Kim

Dr. Jie Li  
Dr. J.P. Morgan  
Dr. Jane Robertson  
Dr. Anne Ryan  
Dr. Eric Smith

Dr. Bill Woodall  
Dr. Xiaowei Wu  
Dr. Hongxiao Zhu

## [4] Introduction and LISA Mission

LISA is the Laboratory for Interdisciplinary Statistical Analysis at Virginia Tech. It was originally founded in 1948 as the Statistical Laboratory, reorganized and renamed in 1973 as the Statistical Consulting Center, and then again reorganized and renamed as LISA in 2008. LISA's mission is to train statisticians to become interdisciplinary collaborators and promote the value of statistical thinking in all phases of scientific research by helping researchers design experiments; collect, analyze, and plot data; run statistical software; interpret results; and communicate statistical concepts to non-statisticians. LISA provides statistical advice, analysis, and education to Virginia Tech researchers by offering individual collaboration meetings, walk-in consulting, educational short courses, and support for interdisciplinary research projects. In the 2012-13 academic year, statistical collaborators from LISA collaborated with researchers on 376 projects from 63 departments, provided statistical advice for 394 visitors to LISA Walk-in Consulting, and taught 582 short course attendees how to apply statistics in their research.

The LISA collaborators are faculty and students in the Department of Statistics. LISA's full-time director and assistant director (partially supported by funded projects) meet with clients and—together with the LISA Administrative Specialist—oversee a team of graduate and undergraduate student collaborators. In addition, the entire statistics faculty may be available for collaboration on a case-by-case basis.

Statistical assistance is free for Virginia Tech faculty, staff, and students. LISA is funded jointly by the Office of the Vice President of Research, the College of Science, the Graduate School, the Office of the Provost, and now all seven other colleges (Agriculture and Life Sciences, Architecture and Urban Studies, Engineering, Liberal Arts and Human Sciences, Natural Resources and Environment, the Pamplin College of Business, and the Virginia-Maryland Regional College of Veterinary Medicine). The Department of Statistics also provides funding for many of the LISA statistical collaborators and provides other support for LISA's activities. The Virginia Bioinformatics Institute (VBI) provided funding for the LISA assistant director from 2010-2012.

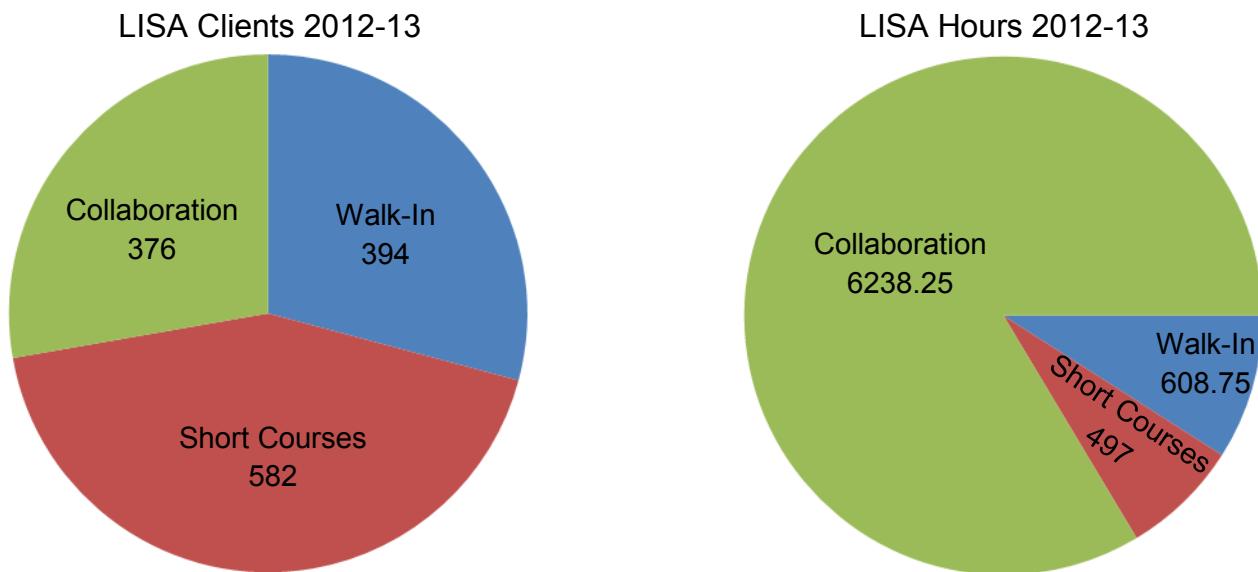
Users of LISA engaging in sponsored research can benefit from in-depth help and are encouraged to include statistical collaboration in grant proposals. This can take the form of a full or partial graduate research assistantship, partial funding of a faculty member's salary, or a direct-cost line item. LISA occasionally provides statistical consultation and collaboration on projects outside of Virginia Tech for a fee. Through StatCom (Statistics in the Community), students in the Department of Statistics also provide pro-bono statistical consultation and collaboration for researchers studying topics of local interest and for local community nonprofits, schools, and governmental organizations.

**This report summarizes LISA's main activities for the 2012-13 academic year, highlights the activities and progress achieved over the past year, and outlines 6 goals for 2013-14.** In addition, this report presents the numbers of clients served and reported hours worked for the past eight years to help place the past year's activities into context.

## Activities and Progress in 2012-13 [5]

**Demand for LISA statistical collaboration and expertise continues to grow.** From all over Virginia Tech, **1352 faculty, staff, and students met with LISA statistical collaborators** for assistance in designing experiments and studies; collecting, cleaning, plotting, and analyzing data; interpreting results of statistical analyses; developing new theories from these results; writing grant proposals and scholarly papers; answering quick questions about statistics; and for learning new statistical methods.

During the 2012-13 academic year, the 54 statistical collaborators of LISA met with researchers from 63 Virginia Tech departments for individual statistical collaboration meetings on **376 projects**. During daily Walk-in Consulting hours, LISA met with 394 faculty, staff, and students to answer quick statistical questions on projects requiring less than 30 minutes of assistance. Twenty-six LISA Short Courses were offered to teach 582 graduate students and other university members how to apply statistics in their research. Overall, LISA provided at least **7344 hours of statistical assistance and education** to members of the Virginia Tech community. Figure 2 shows a summary of the clients and reported hours for LISA's three main services. **This year's 1352 clients were the most LISA has ever helped in a year.**



**Figure 2.** Number of clients and reported hours for LISA's three main services

## [6] Activities and Progress in 2012-13

In last year's annual report we highlighted six goals we thought would advance us toward becoming the premier academic statistical collaboration laboratory. We met or exceeded four of our six goals, made substantial progress toward one, and made partial progress toward one. Our progress is described briefly below and expanded upon in subsequent sections of this report. In addition, since most of our goals have longer than a one-year horizon for achievement, we report on the progress made on the six goals for 2011-12 (from the 2010-11 LISA annual report) and the six goals for 2010-11 (from the 2009-10 LISA annual report).

### 2012-13 Goals

#### 1. *Continuing faculty support and encouragement for deep collaborations/student co-authorships<sup>1</sup>*

- Achieve at least 5 student co-authored publications resulting from a LISA collaboration.

Our efforts to support and encourage collaborations, the natural outcome of which are co-authored publications, were highlighted in May 2013 with the publication of the paper, "Determining scientific impact using a collaboration index" in the *Proceedings of the National Academy of Sciences*. This paper was the result of a collaboration between LISA Lead Collaborator Jonathan Stallings, LISA Director Eric Vance, and Ge Wang, formerly of the School of Biomedical Engineering and Sciences at Virginia Tech. Other LISA collaborators contributing to this paper were Caleb King, Stephen Loftus, Kelley Geyer, and Chaohang Zhang.

LISA students were co-authors on a total of 11 papers in 2012-13, and were co-authors on 6 submitted manuscripts. Details of the publications and submissions can be found starting on page 22.

#### 2. *Improving the quality of our services*

- Maintain 95% or higher positive feedback from our collaboration clients. Video review every collaborator who regularly meets with clients at least once per semester.

LISA invests considerable time and effort into training its statisticians to become excellent statistical collaborators. In 2012-13, 49 of the 52 LISA statistical collaborators who regularly met with clients had at least one collaboration meeting video recorded and reviewed every semester. One result of LISA's focus on training is that we provide excellent service to our clients. In 2012-13, 95% of the collaboration clients who responded to the post-project feedback survey were happy with the services they received. We contacted every client who provided negative feedback to attempt to provide them with better service and to improve their view of LISA. One such client is currently collaborating with a new LISA team on a conference paper and is planning on submitting a co-authored publication in the near future. An overview of the feedback LISA received on its collaboration meetings can be found on pages 16-17.

#### 3. *Recruiting students to the department*

- Have at least 3 incoming students admit that LISA was a major deciding factor in choosing to attend Virginia Tech over somewhere else.

In 2012-13, LISA sent recruiting flyers to 403 department heads and undergraduate coordinators of math, statistics, and computer science departments all over the country to convey the message, "Earn a Ph.D. in Statistics at Virginia Tech and help people, solve real world problems, and travel around the world." See the current recruiting flyer on page 37. Our recruiting efforts resulted in at least 3 incoming students who said that LISA was a major deciding factor in choosing to attend Virginia Tech over somewhere else. One student said, "One of the reasons that I accepted the offer is the applied nature of the VT program and LISA." Another student said that the only reason she applied to Virginia Tech was for the chance to work in LISA.

#### 4. *Securing additional—and permanent—funding for LISA*

- By the end of 2013, LISA must have permanent and sufficient funding for at least 6 lead collaborators; the director, assistant director, and administrative specialist; and for software, supplies, and travel.

In January 2013, the LISA Director presented a short history of LISA, the current state of LISA, and his vision for the future of statistical collaboration at Virginia Tech and around the world to the Vice President of Research and his staff, the Dean of the Graduate School, and the Dean of the College of Science and his staff. This presentation can be viewed at <http://prezi.com/4d91znes7xgy>.

In March 2013, the LISA Director asked current and former LISA collaboration clients for personal letters of support for how LISA has helped them in their research endeavors. The response was overwhelming! One former LISA client wrote, "[LISA] saved us at least \$127,000 over the past five years. [Analysis from LISA] helps us achieve a decades-long goal of a Corps of 1,000 cadets." Another pair of clients wrote that their collaborations with LISA were essential for 16 publications and grants. Another client wrote, "In over twenty years as a professor and researcher at Virginia Tech, I can't think of any comparable investment by the university that has been as beneficial as LISA." A selection of letters of support from LISA clients is available at [www.lisa.stat.vt.edu/?q=support](http://www.lisa.stat.vt.edu/?q=support).

In September 2013, we were informed that LISA would be getting a 25% increase in funding, which came at a time when few programs were able to secure additional resources. The much needed and appreciated increase is a first step toward our continuing goal of promoting statistical collaboration at Virginia Tech and worldwide.

Securing a permanent budget line-item for LISA remains a top priority.

#### 5. *Forming new connections and strengthening the old with VTC, VCOM, and other VT departments*

- Increase the number of collaborations with VTC and VCOM from 2011-12 and collaborate with researchers from at least 50 departments at Virginia Tech.

In 2011-12, LISA collaborated on 22 projects with researchers from the Virginia Tech-Carilion School of Medicine and the Virginia Tech-Carilion Research Institute (VTC) and 2 projects from VCOM. In

## [8] Activities and Progress in 2012-13

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2012-13, LISA collaborated on 25 projects with researchers from VTC and 2 projects from VCOM. Overall, LISA collaborated with researchers from 63 departments at Virginia Tech in 2012-13.

### 6. *Celebrating the International Year of Statistics by making progress on “LISA 2020”*

- Continue to build awareness of LISA 2020 by promoting the vision in at least 3 conference talks or posters. Submit at least 2 grant proposals to fund LISA 2020.

In 2012-13, LISA 2020 evolved from a vision, to a plan, to a program to create a network of 20 statistical collaboration laboratories in developing countries by 2020. The LISA 2020 program was publicized and promoted in 6 talks and 3 posters. See page 25 for more details. The LISA Director wrote 4 grant proposals to fund LISA, including a successful Google Research Award used to fund one statistician from a developing country to be trained to communicate and collaborate with non-statisticians for one year at LISA and Virginia Tech. In April 2013, during just a three-week application period, 108 applicants from 34 developing countries applied to become this first LISA Fellow. See page 33 for more details.

## Progress and Updates on 2011-12 Goals

1. Promote and emphasize interdisciplinary collaborations leading to student co-authorships.

See the update on Goal #1 for 2012-13. LISA students were co-authors on a total of 11 papers in 2012-13 compared to 1 paper in 2011-12.

2. Secure new permanent and increased funding to bolster LISA's efforts to be the premier academic statistical consulting and collaboration laboratory.<sup>1</sup>

See the update on Goal #4 for 2012-13. Permanent funding for LISA from Virginia Tech would be an important demonstration of support for our educational and research commitments to meet the needs and challenges of a data-driven society. Also, permanent funding for LISA will signal to large foundations (Carnegie, Ford, MacArthur, Rockefeller, Gates) that the LISA 2020 program has support from Virginia Tech and a solid base (LISA) from which to operate.

3. Increase the number of collaborations and connections with the Virginia Tech Carilion School of Medicine and Research Institute (VTC), the Institute for Critical Technology and Applied Science (ICTAS), and other departments within Virginia Tech.

See the update on Goal #5 for 2012-13. In spring 2012, LISA began hosting Walk-in Consulting for two hours once a week in ICTAS Café X and continued to do so during 2012-13.

4. Improve the integration between LISA and the graduate statistics course, "Introduction to Statistical Program Packages," and between LISA Short Courses and the graduate service courses, "Statistics in Research, parts I and II."

LISA assistant director Dr. Chris Franck and Dr. Anne Ryan continue to integrate statistical collaboration experiences into their teaching and encourage their students to collaborate with LISA on research projects.

5. Improve the training of LISA statistical collaborators by regularly providing feedback on their performance.

In 2012-13, the director of LISA met individually with LISA students to review feedback received by clients, but not during every semester as intended. Providing feedback to LISA collaborators is an important part of LISA's training and its frequency needs to be increased. See page 29 for an update on LISA's innovative Video Coaching and Feedback Sessions.

6. Encourage other universities to emulate LISA by writing papers and giving talks at national conferences about LISA.

Papers about LISA's methods are still being developed. These methods were featured in 11 talks or posters at national conferences or colloquia, in addition to several at Virginia Tech.

<sup>1</sup> LISA values setting goals, assessing progress toward them, and reflecting on their usefulness. As LISA adapts and changes, its goals must be evaluated and updated. The strikethroughs on the previous years' goals indicate these updates.

## [10] Activities and Progress in 2012-13

### Progress and Updates on 2010-11 Goals

1. Increase collaborations with the Virginia Tech Carilion School of Medicine and Research Institute (VTC) and the Institute for Critical Technology and Applied Science (ICTAS).

See 2012-13 Goal #5 and 2011-12 Goal #3 above.

2. Use LISA to recruit to Virginia Tech statistics graduate students who are eager to apply their statistical knowledge to solve real-world problems and help researchers make discoveries in diverse fields.

See 2012-13 Goal #3 above.

3. Create opportunities for LISA statistical collaborators to become involved “on the ground” in research projects around the world.

In summer 2013, LISA Lead Collaborator Marcos Carzolio and LISA Director Dr. Eric Vance worked in Mozambique as on-the-ground statisticians. These experiences are highlighted in this report on page 36.

4. Present talks at national conferences so that LISA becomes recognized across the country as a model for academic statistical consulting and collaboration.

See Goal #6 from 2011-2012 above. LISA considers “collaboration” to be helping the researcher answer her *research* questions and “consulting” to be helping the researcher answer her *statistical* questions. Since August 2008, LISA’s focus has been on collaboration over consulting.

5. Improve the integration between LISA and the two graduate statistics courses “Introduction to Statistical Program Packages” and “Communication in Statistical Collaborations.” The latter course is designed to teach second-semester statistics graduate students and undergraduate statistics majors what they need to know to be effective statistical collaborators that they don’t learn in their other, more technically focused statistics courses.

In 2012-13, “Communication in Statistical Collaborations” was co-taught by Dr. Eric Vance and Dr. Jane Robertson to 52 graduate and undergraduate statistics majors. Dr. Robertson brought valuable additions to the course, especially by introducing new modules on collaboration and conflict resolution.

6. Use weekly meetings and video coaching and feedback sessions to improve LISA collaborators’ overall statistical collaboration skills, including communication skills and technical statistical skills.

Weekly meetings and video coaching and feedback sessions have become a regular part of LISA’s education and training program. See page 29 for more details.

**As a laboratory for interdisciplinary statistical analysis, LISA creates new knowledge** in at least four ways:

1. We help researchers answer questions they could not have answered without expert statistical advice.
2. Based on our understanding of the researchers' goals and their data, we may suggest novel questions their data can answer.
3. When we encounter new types of data for which standard statistical methods do not apply, we create new knowledge by developing novel statistical methods that enable researchers to extract useful information from their data.
4. We are researching the process of statistical collaboration itself, advancing knowledge in best practices for statistical collaboration and how to improve one's statistical collaboration skills.

In collaboration meetings, we focus on points 1-3 above, contributing statistical expertise to research projects in many disciplines. Collaboration meetings typically last for one hour, with multiple follow-up meetings as necessary. LISA statistical collaborators meet with researchers to discuss their research goals, the nature of the data collected or to be collected, how the data can be analyzed to answer the researcher's specific questions, what the statistical results mean in terms of the research goals, and how the researcher can explain the results to his or her intended audiences. After and between meetings, LISA collaborators typically analyze the clients' data or conduct background research to determine the most appropriate statistical analysis for the client.

LISA met with researchers during the fall 2012 semester on 148 projects for a total of 2457.25 hours. In spring 2013, LISA met with researchers on 141 projects for 2065.75 hours. In the summer semester LISA met with researchers on 87 projects for 1715.25 hours. In total, LISA worked on 375 collaborative projects with researchers from 63 departments. Table 1 below summarizes these numbers.

**Table 1.** Collaboration clients and hours for the 2012-13 academic year

Collaboration	Fall 2012	Spring 2013	Summer 2013	Total
Clients	148	141	87	376
Hours	2457.25	2065.75	1715.25	6238.25

## [12] Walk-In Consulting

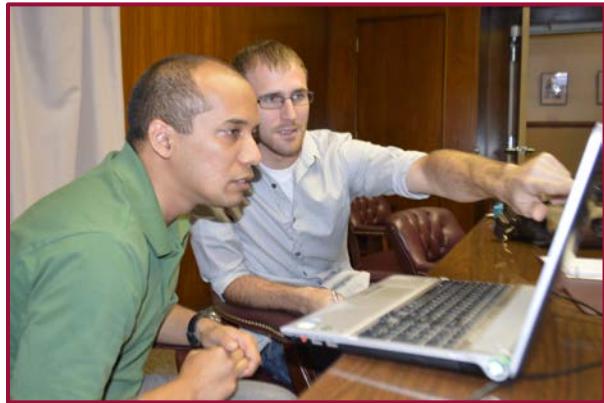
To offer assistance to Virginia Tech researchers who might not require the intense, personalized efforts of the collaboration meetings, **LISA provides walk-in consulting for answering quick questions and giving statistical advice** on smaller, simpler projects. Assistance is limited to less than 30 minutes when others are waiting.

In 2012-13, LISA Walk-in consultants were available for **608.75 hours**, which is an increase of over 50 hours from last year. Our standard time and location for Walk-in Consulting was Monday-Friday from 1-3PM in the GLC Video Conference Room. Additional times and locations were added to keep up with the heavy demand.

LISA Walk-in consultants met with 148 visitors during fall 2012, 177 during spring 2013, and 69 during the summer sessions. During the 2012-13 academic year, **LISA Walk-in consultants met with a total of 394 clients from 61 departments.**

**Table 2.** Walk-In Consulting times and locations during 2012-13

Semester	Day and Time	Location
Fall	Monday – Friday 1-3 pm (standard)	GLC Video Conference Room
Fall	Monday & Wednesday 3-5 pm (additional)	Port
Fall	Tuesday 9:30-11:30 am (additional)	1028 Pamplin Hall
Fall	Thursday 9:30-11:30 am (additional)	ICTAS Café X
Fall	Friday 3-5 pm (additional)	312 Sandy Hall
Spring	Monday – Friday 1-3 pm (standard)	GLC Video Conference Room
Spring	Monday 3-5 pm (additional)	Port
Spring	Wednesday 9-11 am (additional)	ICTAS Café X
Summer	Monday – Friday 1-3 pm (standard)	GLC Video Conference Room



*Jonathan Stallings assists Bireswar Laha a computer science doctoral student during LISA Walk-In Consulting.*

**Table 3.** Walk-In Consulting clients and hours for 2012-13

Walk-In	Fall 2012	Spring 2013	Summer 2013	Total
Clients	148	177	69	394
Hours	289.75	202.5	116.5	608.75

## Short Courses [13]

**LISA teaches a series of evening short courses each semester to help graduate students apply statistics in their research. The focus of these two-hour courses is on learning practical statistical techniques for analyzing or collecting data.** Taught by graduate students and faculty from LISA and the Department of Statistics, these short courses proved to be very popular, with 582 students, faculty, and staff attending. The tables below describe the course titles, instructors, dates, and attendance for the 26 short courses. Seven of these courses were taught twice due to limited classroom size. In 2012-13, **LISA taught a total of 33 short course sessions.**

**Table 4.** LISA Short Course titles, instructors, and attendance for 2012-13

### Fall 2012

Date	Title	Attendance
September 11, 2012	“Designing Experiments and Collecting Useful Data” by Jonathan Stallings	17
September 17 & 18, 2012	“Using JMP to design experiments and analyze the results” by Liaosa Xu <sup>2</sup>	9
September 25, 2012	“Designing Surveys” by Dr. Eric Vance	20
October 2, 2012	“Analyzing Surveys” by Marcos Carzolio	10
October 8, 2012	“Introduction to R, Part I” by Qing Li	22
October 9, 2012	“Introduction to R, Part II” by Qing Li	14
October 15 & 16, 2012	“How to make plots to tell the story of your data” by Andy Hoegh <sup>2</sup>	21
October 29, 2012	“Structural Equation Modeling” by Khaled Bedair	5
November 12, 2012	“Introduction to R, Part III” by Liang (Sally) Shan	9
		127

### Spring 2013

Date	Title	Attendance
January 29, 2013	“Designing Experiments and Collecting Useful Data” by Jonathan Stallings	30
February 5, 2013	“A Tutorial in T-Tests and ANOVA using JMP” by Dr. Anne Ryan	44
February 12, 2013	“Regression Analysis Using JMP” by Yiming Peng	14
February 18 & 19, 2013	“Introduction to R, Part I” by Jinhui Sun <sup>2</sup>	46
February 25, 2013	“Introduction to R, Part II” by Ning Wang	19
February 26, 2013	“Introduction to R, Part III” by Peng Sun	14
March 5, 2013	“How to make plots to tell the story of your data” by Andy Hoegh	11
March 18 & 19, 2013	“Data Mining Basics” by Marcos Carzolio <sup>2</sup>	22
March 26, 2013	“Classification and Regression Trees” by Dr. Chris Franck	23
		223

### Summer 2013

Date	Title	Attendance
June 10, 2013	“Structural Equation Modeling (SEM) Using AMOS” by Khaled Bedair	29
June 17, 2013	“Designing Experiments and Collecting Useful Data” by Jonathan Stallings	38

## [14] Short Courses

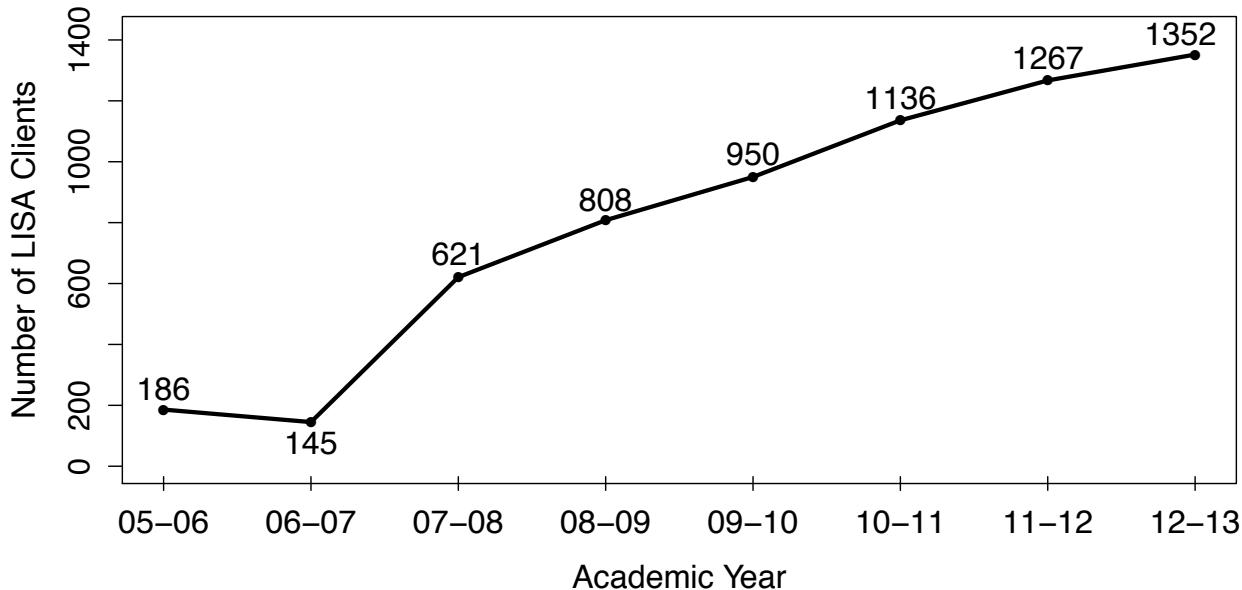
June 24 & 25, 2013	“Basics of R” by Ana Maria Ortega Villa <sup>2</sup>	45
July 1 & 2, 2013	“Statistical Analysis in R” by Ning Wang <sup>2</sup>	39
July 8 & 9, 2013	“Graphing with R” by Ian Crandell <sup>2</sup>	28
July 15, 2013	“SAS Programming I” by Matt Lanham	28
July 16, 2013	“SAS Programming II” by Matt Lanham	21
July 22, 2013	“Model selection in R featuring the lasso” by Dr. Chris Franck	13
		241

<sup>2</sup> Two sessions of these courses were taught because of limited classroom size.

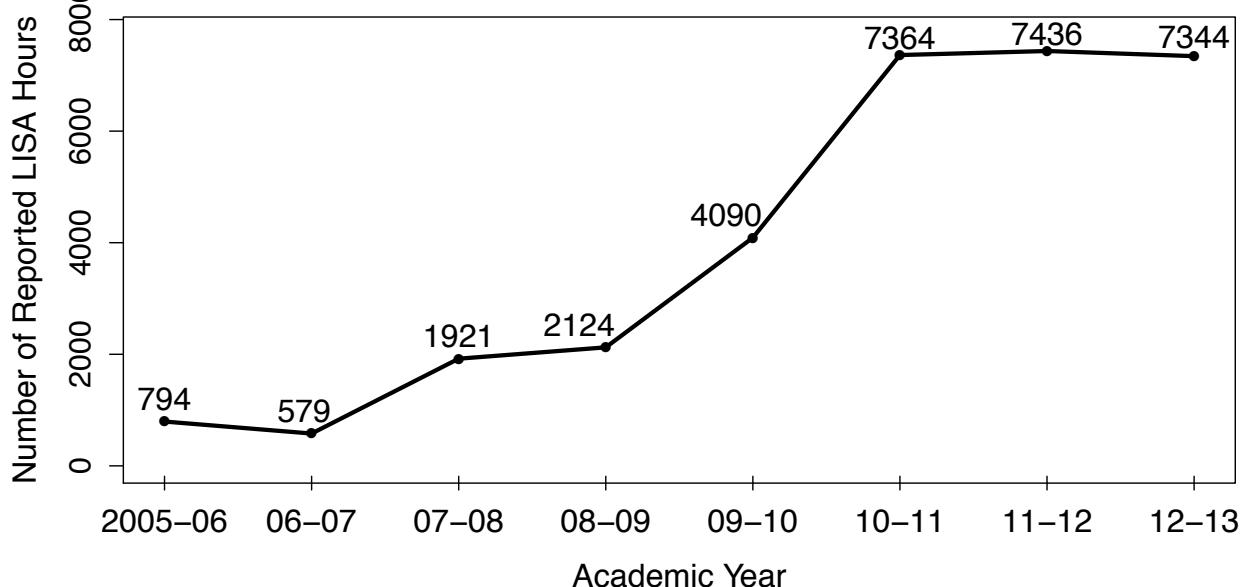
## Total Clients and Reported Hours [15]

The two plots below (Figure 3) show the total number of LISA clients and reported hours for our three main services of Collaboration, Walk-in Consulting, and Short Courses for the past eight academic years. LISA was created in spring 2008 to succeed the Statistical Consulting Center, which was created in 1973 (with roots going back to 1948). In summer 2008, LISA began offering short courses. In fall 2008, LISA began offering Walk-in Consulting.

**Total LISA Clients:  
Academic Years 2005–06 to 2012–13**



**Total Reported LISA Hours:  
Academic Years 2005–06 to 2012–13**

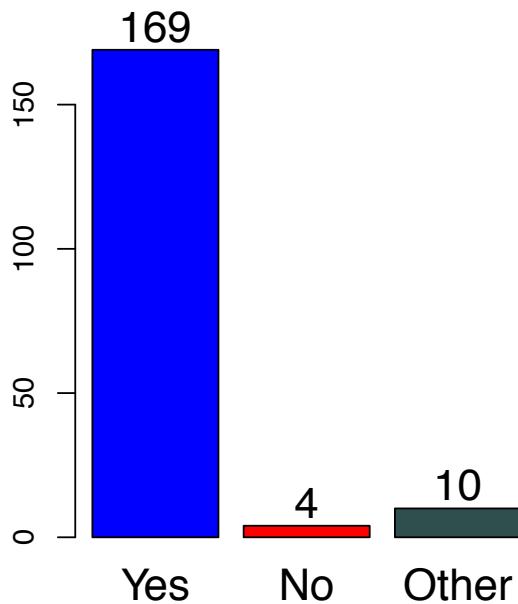


**Figure 3.** Total number of LISA clients and reported hours for Collaboration, Walk-In Consulting, and Short Courses

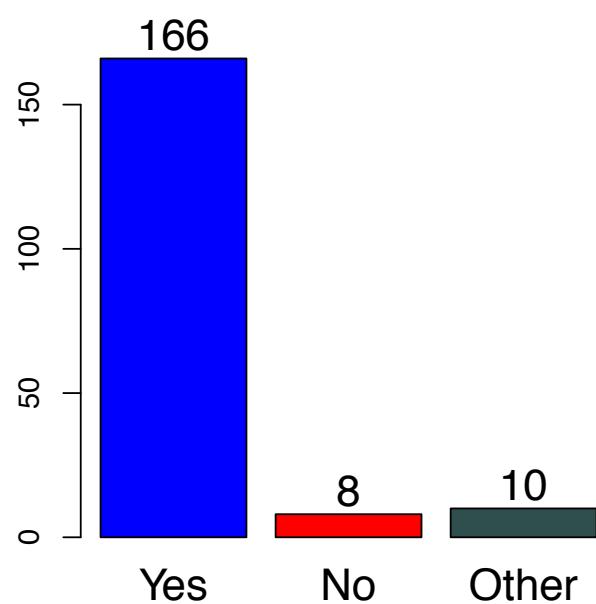
## [16] Feedback from Clients

At the conclusion of each academic term, clients who requested statistical collaboration meetings are asked to fill out a feedback survey evaluating their experience with LISA. Below are the summaries of two of the survey questions (Figure 4) and a selection of comments (next page) from clients in each of the eight colleges at Virginia Tech. By counting “Other” responses as half “Yes” and half “No”, **95% of LISA clients considered LISA’s services “helpful”, and 93% were satisfied with their overall LISA experience.**

**Q1: Was the service you received from LISA helpful?**



**Q2: Were you satisfied with your overall LISA experience?**



**Figure 4.** Summary of quantitative feedback on LISA collaboration meetings

# Selected Client Quotes [17]

## Ted Koebel, CAUS

I have found [LISA] to be one of the most important and valuable resources supporting research at Virginia Tech. [LISA's involvement in our research] has been essential to our success. LISA's involvement has increased the quality of our research immeasurably. It wasn't just an enhancement; it was the difference between producing accurate, defensible research results and otherwise problematic results. In over twenty years as a professor and researcher at Virginia Tech, I can't think of any comparable investment by the university that has been as beneficial as LISA.

## Bradford Wiles, CLAHS

My LISA collaborators were truly fantastic in providing statistical assistance and guidance, under a tight deadline, to help me choose the right analyses for my data. My experience with LISA was among the best I have had in my years at Virginia Tech. During the course of my collaboration with Jon his mother lost her life and he went home to be with his family. To his immense credit, he did not leave me high and dry, but he carried on with our work, stating that "My Mom would want me to". While I don't know if I could have performed as he did in a similar situation, I am forever grateful and impressed by his dedication to our partnership. He truly deserves the highest of recognition for his dedication, tenacity, and triumph in the face of overwhelming adversity. He was truly inspirational.

## Jenni Rogers, COE

LISA was a necessary, crucial, and valuable member of the village that it took to complete my interdisciplinary research. Without their help, learning the computer tools required for the statistical aspects of my research could have easily taken over one semester and set back my project significantly. Now that I am working in the industry, I work closely with a reviewer for the AACE International (Association for Advancement of Cost Engineering) Journal, and I have had the opportunity to review paper submissions from time to time. The most common reason that we have dealt with for paper rejections are improper use or interpretation of the math, namely statistics. Once this is found in a body of work, all confidence is lost in the author/researcher. It will help the integrity and reputation of Virginia Tech if the work that is produced at our University is not filled with the same research pitfalls as so many others.

## Ronald Tyler Jr., CVM

Johnathan Stallings and Chen did a great job explaining and helping me look at the statistical differences between groups for our research project. They were the utmost professionals and great to work with.

## Kelsey Brunton, CALS

[Jonathan Stallings] was incredible to work with. He was very well organized and prepared for every meeting. He is very skilled at communicating statistical analyses to students who are not statisticians. He also incorporated and "coached" his partner with the LISA consulting. He had genuine interest in my research and helping me succeed. Thanks Jonathan!

## Bob Wright, CNRE

LISA staff helped immensely cipher through the mix of variables and sample populations to extract the most meaningful information. The contribution by LISA staff was excellent and allowed for a solidly defensible position.

## Julie and Ray Danner, COS

[LISA] has been essential in our successes as graduate students and now as postdoctoral fellows at the Smithsonian Institution. LISA is very effective at helping researchers develop advanced statistical needs by encouraging individual learning in a guided relationship. As a result of our growth with LISA, we are known among colleagues as competent quantitative scientists and are often looked to for statistical guidance.

## Alan Abrahams, Pamplin

I have made use of LISA's services on a number of occasions over the past few years and have found them to be very helpful to my publication efforts, saving me substantial time, pointing me on the track of correct and viable statistical analyses and tools, and resulting in the submission of high quality journal publications. I believe the LISA service will continue to be of great value to me personally on my future projects and to the Virginia Tech research community in general.

Additional letters of support available:  
[www.lisa.stat.vt.edu/?q=support](http://www.lisa.stat.vt.edu/?q=support)

## [18] Grants and Grant Proposals Involving LISA

LISA provides statistical support for sponsored projects and collaborates with researchers across disciplines on grant proposals. In 2012-13, LISA was funded on 14 grants. LISA collaborators were co-PIs or key personnel on 12 grant proposals.

### Funded Projects:

1. (PI Warren Bickel, VTCRI) 9/08-6/13  
*NIH/NIDA*  
“Executive Function Therapy for Stimulant Addiction”  
This grant provided funding for LISA statistical collaborator **Chris Franck**.
2. (PI Warren Bickel, VTCRI) 9/08-9/13  
*NIH/NIAAA*  
“Executive Function Therapy for Stimulant Addiction” (ARRA Supplement)  
This grant provided funding for LISA statistical collaborator **Chris Franck**.
3. (PI McCoy, Building Construction) 1/12-1/14  
*HUD*  
“Impact of Market Behavior on the Adoption and Diffusion of Innovative Green Building Technologies”  
This grant provided funding for LISA statistical collaborator **Chris Franck**.
4. (PI Warren Bickel and Read Montague, VTCRI) 7/10-6/15  
*NIH/NIDA*  
“Inter-Temporal Trade-offs in the Risky Decisions of Cocaine Addicts”  
This grant provided funding for LISA statistical collaborator **Chris Franck**.
5. (PI Warren Bickel) 7/15/2013-6/30/2018  
*NIH/NIDA*  
“Self-Control Improvement Intervention (SCII): Improving Abstinence in Smokers”  
This grant provided funding for LISA statistical collaborator **Chris Franck**.
6. (PI Dorothy Hatsukami) 9/20/2012-9/19/2017  
*NIH/NCI*  
“Models for Tobacco Product Evaluation”  
This grant provided funding for LISA statistical collaborator **Chris Franck**.
7. (PI Chris Scheffer) 7/13-6/15  
*City College of New York*  
“Enhancing Relapse Prevention for Smoking Cessation with rTMS”  
This grant provided funding for LISA statistical collaborator **Chris Franck**.
8. (PI Ralph Hall, Department of Urban Affairs and Planning) 1/12-12/12  
*Millennium Challenge Corporation*  
“Impact Evaluation for the Millennium Challenge Corporation-Supported Rural Water Investment in Mozambique”  
This grant included funding for LISA statistical collaboration from **Eric Vance, Mark Seiss, Andrew Hoegh, and Marcos Carzolio**.

## Grants and Grant Proposals Involving LISA [19]

9. (PI Ralph Hall, Department of Urban Affairs and Planning) 1/13-12/13  
Co-PI: **Eric Vance**, LISA  
*Millennium Challenge Corporation*  
“Impact Evaluation for the Millennium Challenge Corporation-Supported Rural Water Investment in Mozambique”  
This grant included funding for LISA statistical collaboration from **Eric Vance** and **Marcos Carzolio**.
10. (PI **Eric Vance**, LISA) 4/13-12/14  
*Google Research Awards*  
“Building Statistics Capacity in Developing Countries by Educating and Training Statisticians to Communicate and Collaborate with Non-statisticians”  
This grant resulted in 108 applications from 34 countries to become the first Google-supported LISA Fellow in the LISA 2020 program.
11. (PI **Eric Vance**, LISA) 7/13-9/14  
iAGRI/USAID  
“Growing Research Capacity at SUA by Creating a Statistical Collaboration Laboratory”  
This grant will support travel for **Eric Vance** and education and training for **Emanuel Msemo** related to the LISA 2020 program.
12. (PI Mary Marchant, Department of Agricultural Economics) 9/11-9/12  
Co-PIs: **Eric Vance**, LISA and Eric Smith, Department of Statistics  
USDA/NIFA  
“Improvement and Marketing of the Food and Agricultural Education Information System (FAEIS)”  
This grant included funding for LISA statistical collaborators **Eric Vance**, **Katie Griffin**, and **Hao Lu**.
13. (PI Mary Marchant, Department of Agricultural Economics) 9/12-9/13  
Co-PIs: **Eric Vance**, LISA and Eric Smith, Department of Statistics  
USDA/NIFA  
“The Food and Agricultural Education Information System (FAEIS)”  
This grant includes funding for LISA statistical collaborators **Eric Vance** and **Hao Lu**.
14. (PI Susan Duncan, Department of Food Science and Technology) 3/13-3/14  
Collaborator: **Anne Ryan**  
*College of Agriculture and Life Sciences Integrated Internal Competitive Grant*  
“Use of Cross-Disciplinary Teaching in Engaging Undergraduate Students to Improve Critical Thinking and Communication Skills”

### Proposals Submitted:

1. PI Warren Bickel  
Co-I: **Chris Franck**  
*National Institutes of Health*  
“Temporal Discounting as a Neuro-Behavioral Biomarker for Tobacco Dependence”

## [20] Grants and Grant Proposals Involving LISA

2. PI Warren Bickel  
Statistician: **Chris Franck**  
*National Institutes of Health*  
“Self-Control Improvement Intervention (SCII): Improving Abstinence in Smokers”
3. PI Eubank and Warren Bickel  
Co-I: **Chris Franck**  
*National Institutes of Health*  
“Center for Forecasting Tobacco Regulations’ Regional Effectiveness”
4. PI Michael Madigan  
Co-PI: **Chris Franck**  
*National Institutes of Health*  
“Balance recovery training for fall prevention among older adults in retirement communities”  
\$427,799, April 1, 2014–March 31, 2016, Franck (20%)
5. PI Brian Kleiner  
Statistician: **Chris Franck**  
*NIOSH*  
“NIOSH National Construction Center (NCC): A New Step”  
\$28,713,674, Franck (1%)
6. PI Andrew McCoy  
Co-PI: **Chris Franck**  
*Window and Skylight Manufacturers*  
“Improving the Value of the Reporting and Intelligence of the Nation’s Door”  
\$50,000, Franck (50%)
7. PI David Mittelman  
Statistician: **Chris Franck**  
*Mount Sinai School of Medicine*  
“Origins and Function of Microsatellite Variation in Human Populations”  
\$697,755, Franck (17%)
8. PI Kathy Alexander  
Co-PI: **Eric Vance**  
*National Science Foundation: Coupled Human and Natural Systems*  
“Human Development, Wildlife, Climate Change, and Disease”
9. PI Kathy Alexander  
Co-PI: **Eric Vance**  
*National Science Foundation: Emerging Infectious Disease*  
“Pathogen Transmission Dynamics in Mongooses”
10. PI **Eric Vance**  
*American Statistical Association Member Initiative Proposal*  
“LISA 2020: Training statisticians from developing countries to create a network of statistical collaboration laboratories”

## Grants and Grant Proposals Involving LISA [21]

### 11. PI **Eric Vance**

*International Statistics Institute Strategic Initiative Proposal*

“LISA 2020: Building Statistical Collaboration Capacity in Developing Countries”

### 12. PI: Mary Merchant, Department of Agricultural Economics, 9/13-9/14

Co-PIs: **Eric Vance**, LISA and Eric Smith, Department of Statistics

*USDA/NIFA*

“The Food and Agricultural Education Information System (FAEIS)”

## [22] Publications and Selected Presentations

One of LISA's missions is to **contribute statistical thinking to interdisciplinary research projects.** The natural result of such collaborative projects is a co-authored publication or a series of publications. In 2012-13, LISA collaborators were co-authors on 18 peer-reviewed publications and submitted 13 others. **LISA students were co-authors on 11 of these publications.**

### *Co-authored publications:*

1. **Stallings, J., Vance, E.A.**, Yang, J., Vannier, M.W., Liang, J., Pang, L., Dai, L., Ye, I., and Wang, G., (2013), Determining scientific impact using a collaboration index. *Proceedings of the National Academy of Sciences*.
2. Neal II, R.E., Rossmeisl, Jr, J.H., Robertson, J.L., Arena, C.B., Davis, E.M., Singh, R.N., **Stallings, J.**, and Davalos, R.V., (2013), Improved local and systemic anti-tumor efficacy for irreversible electroporation in immunocompetent versus immunodeficient mice. *PLoS ONE*, 8(5):e64559.
3. Wang, H., Masters, S., Hong, Y., **Stallings, J.**, Falkingham, J., Edwards, M., and Pruden, A., (2012), Effect of disinfectant, water age, and pipe material on occurrence and persistence of legionella, mycobacteria, pseudomonas aeruginosa, and two amoebas. *Environmental Science & Technology*, 46(21):11566–11574.
4. Alexander, K.A., **Carzolio, M.**, Goodin, D., and **Vance, E.A.**, (2013), Climate Change is Likely to Worsen the Public Health Threat of Diarrheal Disease in Botswana. *International Journal of Environmental Research and Public Health*, 10(4): 1202-1230.
5. **Vance, E.A.**, Xie, X., Henry, A., Wernz, C., and Slonim, A.D., (2013), Computed Tomography Scan Use Variation: Patient, Hospital, and Geographic Factors. *The American Journal of Managed Care*, 19(3):e93-e99.
6. **Franck, C.T.**, Nielsen, D.M., and Osborne, J.A., (2013), A method for detecting hidden additivity in two-factor unreplicated experiments. *Computational Statistics and Data Analysis*, 67: 95-104.
7. Aruguete, D.M., Kim, B., Hochella, M.F., Ma, Y., Cheng, Y., **Hoegh, A.**, Liu, J., and Pruden, A., (2013), Antimicrobial nanotechnology: its potential for the effective management of microbial drug resistance and implications for research needs in microbial nanotoxicology. *Environmental Science: Processes & Impacts*, 15: 93-102.
8. Stephens, T.D., Brooks, R.M., Carrington, J.L., **Cheng, L.**, Carrington, A.C., Porr, C.A., and Splan, R.K., (2013), Effects of Pentoxifylline, Caffeine, and Taurine on Post-Thaw Motility and Longevity of Equine Frozen Semen. *Journal of Equine Veterinary Science*, 33(8): 615-621.
9. Traver, B.E., **Wiliams, M.R.**, and Fell, R.D., (2012), Comparison of within hive sampling and seasonal activity of *Nosema ceranae* in honey bee colonies. *Journal of Invertebrate Pathology*, 109(2): 187-193.
10. Mulholland, G.E., Traver, B.E., **Johnson, N.G.**, and Fell, R.D., (2012), Individual Variability of *Nosema ceranae* Infections in *Apis mellifera* Colonies. *Insects*, 3(4): 1143-1155.

## Publications and Selected Presentations [23]

11. McAvoy, T.J., Snyder, A.L., **Johnson, N.G.**, Salom, S.M., and Kok, L.T. (2012), Road Survey on the Invasive Tree-of-Heaven (*Ailanthus altissima*) in Virginia. *Invasive Plant Science and Management*, 5(4): 506-512.
12. Van Houweling, E., Hall, R.P., Sakho Diop, A., Davis, J., and **Seiss, M.** (2012), The Role of Productive Water Use in Women's Livelihoods: Evidence from Rural Senegal. *Water Alternatives*, 5(3): 304-323.
13. Highnam, G., **Franck, C.T.**, Martin, A., Calvin, S., Puthige, A., and Mittelman, D., (2013), Accurate human microsatellite genotypes from high-throughput resequencing data using informed error profiles. *Nucleic Acids Research*, 41(1): e32.
14. Ball, D.A., Adames, N.R., Reischmann, N., Barik, D., **Franck, C.T.**, Tyson, J.J., and Peccoud, J., (2013), Measurement and modeling of transcriptional noise in the cell cycle regulatory network. *Cell Cycle*, 12(19): 3203–3218.
15. Levine, M., Moore, A., Kuehl, D., **Franck, C.T.**, and Li, J., (2013), Variation in Use of All Types of Computed Tomography by Emergency Physicians. *The American Journal of Emergency Medicine*, 31(10):1437-1442.
16. Bickel, W.K., Jarmolowicz, D.P., Mueller, E.T., **Franck, C.T.**, Carrin, C., and Gatchalian, K.M., (2012), Altruism in Time: Social Temporal Discounting Differentiates Smokers from Problem Drinkers. *Psychopharmacology*, 224(1):109-120.
17. Jarmolowicz, D.P., Bickel, W.K., Carter, A.E., **Franck, C.T.**, and Mueller, E.T., (2012), Using Crowdsourcing to Examine Relations Between Delay and Probability Discounting. *Behavioural Processes*, 91(3):308-312.
18. Dal Cengio Leonardi A., Keane, N.J., Bir, C.A., **Ryan, A.G.**, Xu, L., and VandeVord, P.J., (2012), Head orientation affects the intracranial pressure response resulting from shock wave loading in the rat. *Journal of Biomechanics*, 45 (15), 2595-602.

### **Publications Submitted:**

1. Trumbo, B.A., Nislow, K.H., **Stallings, J.**, Hudy, M., Smith, E.P., Kim, D., Wiggins, B., and Dolloff, C.A. Ranking site vulnerability to increasing temperatures in southern Appalachian brook trout streams, state of Virginia: An exposuresensitivity approach. (Submitted in 2013 to *Transactions of the American Fisheries Society*.)
2. Contreras, R., Ruter, J., Owen, J., and **Hoegh, A.** Chlorophyll, carotenoid, and visual color rating of Japanese-cedar grown in the southeastern United States. (Submitted in 2013 to *HortScience*.)
3. Parkunan, V., Johnson, C.S., **Xu, L.**, **Peng, Y.**, Tolin, S.A., and Eisenback, J.D. Induction and Maintenance of Systemic Acquired Resistance by Acibenzolar-S-Methyl in three Cultivated Tobacco Types. (Resubmitted in 2013 to *Plant Disease*.)
4. Prussin, A.J., **Li, Q.**, **Malla, R.**, Ross, S., and Schmale III, D.G. Monitoring the Long Distance Transport of *Fusarium graminearum* from Field-Scale Sources of Inoculum. (Submitted in 2013 to *Plant Disease*.)

## [24] Publications and Selected Presentations

5. Smith-McKenna, E.K., Resler, L.M., Tomback, D.F., **Zhang, H.**, Malanson, G. P. Topographic Influences on the Distribution of White Pine Blister Rust in *Pinus albicaulis* Treeline Communities. (Resubmitted in 2013 to *ÉCOSCIENCE*.)
6. **Franck, C.T.**, Koffarnus, M.N., House, L.L., and Bickel, W.K. Accurate characterization of delay discounting using multiple models, approximate Bayesian model selection, and a unified discounting measure. (Submitted in 2013.)
7. Brunson, C., Fassino, S., McInnes, A., Narayan, M., Richardson, B., **Franck, C.T.**, Ion, P., and Laubenbacher, R. Evolutionary events in a mathematical sciences research collaboration network. (Submitted in 2013.)
8. Anderson, D.E., **Franck, C.T.**, and Madigan, M.L. The effects of age and gait spatio-temporal characteristics on required coefficient of friction during level walking. (Submitted in 2013 to *Ergonomics*.)
9. Monaco, T.A., Taylor, J.A., Langenbach, A., Gordon, S., **Vance, E.** Evaluation of the intra- and interobserver reliability using combined segmental measurement techniques for predicting immediate post-deployment intraluminal tracheal stent length in dogs. (Submitted in 2013 to *The Canadian Veterinary Journal*.)
10. **Seiss, M.**, **Vance, E.**, Hall, R. The Importance of Cleaning Data During Fieldwork: Evidence from Mozambique. (Submitted in 2013 to the *Journal of Official Statistics*.)
11. Hall, R.P.; **Vance, E.A.**; Van Houweling, E.; Davis, J. Exploring the Link between the Productive Use of Rural Piped Water and System Performance in Senegal. (Submitted in 2013 to *Water Resources Research*.)
12. Hightower, L.S., **Lu, H.**, Marchant, M.A., **Vance, E.A.**, Smith, E.P., Richardson, W.W. Exploring Baccalaureate Enrollment for Minority Students in Agriculture and Life Sciences Programs. (Submitted in 2013 to the *North American Colleges and Teachers of Agriculture (NACTA) Journal*.)
13. Sharma, A., Marchant, M.A., **Vance, E.A.**, Smith, E.P., Richardson, W.W., Hightower, L.S. The Scholarship of Study Abroad Programs: Engaging Students through International Experiences. (Submitted in 2013 to the *NACTA Journal*.)

### *Selected Other (non peer-reviewed) Publications:*

1. Hall, R., Davis, J., **Vance, E.** Impact Evaluation of the Rural Water Activity Under a Cooperative Agreement between MCC and Stanford University: Impact Evaluation Design and Implementation Report, April 2013.
2. **Vance, E.** International Experiences in Statistics, *Amstat News*, 2012. <http://magazine.amstat.org/blog/2012/06/01/internationalexperiences/>
3. Hightower, L.S., Marchant, M.A., Richardson, W.W., **Vance, E.A.**, Smith, E.P., Mack, T. **Baccalaureate enrollment for minorities in Natural Resources and Conservation (NRC) disciplines**, FAEIS Newsletter, June 2013.

## Publications and Selected Presentations [25]

4. Hightower, L.S., Marchant, M.A., Richardson, W.W., **Vance, E.A.**, Smith, E.P., Mack, T. **Forecasting the Supply of Graduates in the Educational Pipeline**, FAEIS Newsletter, April 2013.
5. Hightower, L.S., Marchant, M.A., Richardson, W.W., **Vance, E.A.**, Smith, E.P., Mack, T. **Trends in Graduate Enrollment at Public and Land-Grant Institutions**, FAEIS Newsletter, February 2013.
6. Hightower, L.S., Marchant, M.A., Richardson, W.W., **Vance, E.A.**, Smith, E.P., Mack, T. **Trends Occurring in the Number of Baccalaureate Degrees Awarded in Different U.S. Regions**, FAEIS Newsletter, December 2012.
7. Hightower, L.S., Marchant, M.A., Richardson, W.W., **Vance, E.A.**, Smith, E.P., Mack, T. **Minorities are Sustaining the Growth in Undergraduate Student Enrollment in Family and Human Sciences**, FAEIS Newsletter, October 2012.
8. Hightower, L.S., Marchant, M.A., Richardson, W.W., **Vance, E.A.**, Smith, E.P., Mack, T. **Trends for Minority Students Enrolled in Colleges and Departments of Agriculture and Natural Resources at 98 Higher Education Institutions Across the United States**, FAEIS Newsletter, September 2012.
9. Hightower, L.S., Marchant, M.A., Richardson, W.W., **Vance, E.A.**, Smith, E.P., Mack, T. **Trends in Gender for Undergraduates in Programs in Natural Resources and Conservation at Institutions Affiliated with NAUFRP - National Association of University Forest Resources Programs**, FAEIS Newsletter, August 2012.

### *Intellectual Property Disclosures/Patents:*

1. VTIP disclosure 14-005 "Method for determining microsatellite repeat genotypes from NGS data" Inventors: David Mittelman & **Christopher Franck**

### *Selected Posters and Presentations:*

LISA collaborators are often invited to talk about statistics and/or LISA and to present work stemming from statistical collaborations and their own research on improving the process of statistical collaboration. The following are a selection of 30 posters and presentations by LISA collaborators in 2012-13:

1. **Marcos Carzolio**, "Beyond Consulting: Training to Become an Interdisciplinary Statistical Collaborator." Invited paper presented in August 2013 at the Joint Statistical Meetings, Montreal, Canada.
2. **Marcos Carzolio**, "Beyond Consulting: Training to Become an Interdisciplinary Statistical Collaborator." Poster presented in February 2013 at the Conference on Statistical Practice in New Orleans, LA.

## [26] Publications and Selected Presentations

3. **Jonathan Stallings and Amy Tillman**, "Stories from LISA Collaborators," Presented in October 2012 at the Virginia Tech Department of Statistics Corporate Partners Conference, Blacksburg, VA.
4. **Eric Vance**, "Introduction to LISA." Presented in August 2012 at the Virginia Tech FDI New Faculty Orientation, Blacksburg, VA.
5. **Eric Vance**, "LISA 2020: A vision to create a network of 20 statistical collaboration laboratories in developing countries by 2020." Poster presented at the *Department of Statistical Science 25<sup>th</sup> Anniversary Conference*, Duke University, October 2012.
6. **Eric Vance**, "Using Team-Based Learning to Teach Effective Communication and Collaboration." Poster presented at *Virginia Tech's 5th Annual Conference on Higher Education Pedagogy*, February 2013.
7. Hightower, L., **Lu. H.**, Marchant, M.A., **Vance, E.**, Richardson, W., Smith, E., Mack, T. Exploring Educational Attainment of Undergraduate Minority Students in Land-Grant Institutions. Poster presented at *Virginia Tech's 5th Annual Conference on Higher Education Pedagogy*, February 2013.
8. **Eric Vance**, "LISA 2020: A vision to create a network of 20 statistical collaboration laboratories in developing countries by 2020." Poster presented at the *VT Engage Showcase*, April 2013.
9. **Eric Vance**, "Seeking Partners for LISA 2020: Creating a network of statistical collaboration laboratories in developing countries." **Invited** poster presented at the Joint Statistical Meetings, Montreal, Canada, August 2013.
10. Hightower, L., **Lu. H.**, Marchant, M.A., **Vance, E.**, Richardson, W., Smith, E., Mack, T. Exploring Educational Attainment of Undergraduate Minority Students in Land-Grant Institutions. Paper presented at *North American Colleges and Teachers of Agriculture (NACTA) Annual Conference*, Blacksburg, VA. June 2013.
11. **Eric Vance** and Ralph Hall, "Best practices for cultural competency." Presented at the VT Engage Symposium in April 2013.
12. **Eric Vance**, "LISA 2020: Building statistics capacity in developing countries by training statisticians to communicate and collaborate with non-statisticians." **Invited** paper presented at the Joint Statistical Meetings in Montreal in August 2013.
13. **Eric Vance**, "International Statistical Consulting: Current Initiatives to Build Statistics Capacity in Developing Countries." **Invited** session at the Joint Statistical Meetings in Montreal in August 2013.
14. **Eric Vance**, "How You Can Help with the LISA 2020 Initiative to Build Statistics Capacity in Developing Countries." Roundtable discussion hosted at the Joint Statistical Meetings in Montreal in August 2013.

## Publications and Selected Presentations [27]

15. **Eric Vance**, "LISA 2020 and Ut Prosim: Building statistics capacity in developing countries." International Year of Statistics Colloquium presented at the Virginia Tech Department of Statistics in April 2013.
16. **Eric Vance**, "Teaching Statistical Collaboration." **Invited** paper presented at the ASA Conference on Statistical Practice in New Orleans, LA in February 2013.
17. **Eric Vance**, "On-the-ground Statisticians in Mozambique." **Invited** colloquium at Wake Forest University Department of Mathematics in November 2012.
18. **Vance, E.**, Smith, H., **Stallings, J.**, Stinnett, S., Zahn, D. "Understanding and Improving the Non-Technical Aspects of Client-Consultant Interactions." Topic-contributed panel session at the Joint Statistical Meetings, Montreal, August 2013.
19. **Chris Franck**, "Wins, Losses, and Lessons as an Early-Career Statistician Collaborating and Teaching in University, Research Institute, and Medical School Settings." Topic Contributed paper presented at the 2013 Joint Statistical Meetings in Montréal.
20. **Franck, C.T.**, Highnam, G., Leman, S., and Mittelman, D., "Characterizing genetic variation from high-throughput sequencing data using Dirichlet process Gaussian mixture models." Personal Genomes & Medical Genomics, Cold Spring Harbor, NY 2012.
21. Moore, A.B., Levine, M.B., Kuehl, D., **Franck, C.T.**, and Lie, J., "Emergency Department Physician Computed Tomography Utilization and Admission Rates." ACEP annual research forum in Seattle in October.
22. Levine, M., Moore, A., Kuehl, D., **Franck, C.T.**, and Li, J., "Emergency Physician Variation in Admissions for Common Chief Complaints." ACEP annual research forum in Seattle in October.
23. McCoy, A., Koebel, T., **Franck, C.T.**, Sanderford, D., and Rahmandad, H., "Impact of Market behavior on the adoption and diffusion of innovative green building technologies in residential firms" Semi-Annual update
24. Moody, L., **Franck, C.T.**, Mueller, E., Carter, A., Jarmolowicz, D., Gatchalian, K., Koffarnus, M., and Bickel, W., "Executive Functioning Deficits in Alcohol-Dependent and Alcohol- and Cocaine-Dependent Individuals." *American Psychological Association*, 2013.
25. Moore, A.B., Levine, M.B., Kuehl, D., **Franck, C.T.**, and Lie, J., "Increase and Variation in Computed Tomography use for Obese Patients by EM Physicians." *Society for Academic Emergency Medicine Mid-Atlantic Regional Conference*, February 2nd, 2013.
26. McCoy, A.P., Koebel, C.T., Sanderford, A.R., **Franck, C.T.**, and **Keefe, M.**, "Narrowing the Chasm: Agile Patterns of Adoption and Diffusion of Innovation in the US Housing Industry From 2000-2010." *Industry Studies Association Conference* at the Kaufman Foundation, 2013.
27. Boone, J.H., Archbald, L.R., Carman, R.J., McCoy, C., Wickham, K., Guerrant, R., **Franck, C.T.**, and Lyerly, D.M., "Hospitalized patients with ribotype 027 clostridium difficile infection and stool cytotoxicity have more severe disease with an increased risk of death." *United European Gastroenterology Week*, Amsterdam, The Netherlands 2012.

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## [28] Publications and Selected Presentations

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28. Moody, L., **Franck, C.T.**, Mueller, E., Carter, A., Jarmolowicz, D., Gatchalian, K., Koffarnus, M., and Bickel, W., "Executive Functioning Deficits in Cocaine-Dependent Individuals." *The College On Problems of Drug Dependence*, 2013.
29. Bickel, W., **Franck, C.T.**, Mueller, E., Carter, A., Jarmolowicz, D., Gatchalian, K., Koffarnus, M. and Moody, L., "Executive Functioning Differences in Individuals with Alcohol Use Disorders." *Research Society on Alcoholism*, 2013.
30. **Andy Hoegh**, "StatCom at Virginia Tech: An Overview of Student-Led Pro Bono Statistical Consulting." Joint Statistical Meetings, Montreal, August 2013. (Received the Best Poster Award from the Section on Statistical Consulting.)

## Video Coaching and Feedback Sessions [29]

LISA's main activity is interacting with clients during collaboration meetings to help them advance their research through the collection, modeling, analysis, and interpretation of data. In fall 2010, LISA began collecting and analyzing data on itself to improve collaboration meetings by video recording meetings, watching the videos, and then analyzing them in a small group setting of typically 5-7 participants, including 1 faculty member, 1 note taker, 1-2 "stars" of the video, and 1 or more additional students.

Of the 52 LISA statistical collaborators who regularly met with clients in 2012-13, 49 had at least one collaboration meeting videoed and reviewed each semester they were active in LISA. Coaching and feedback in these review sessions focused on how to improve collaboration skills. Participants focused on three aspects of the meeting:

1. Interpersonal relationships between the client and collaborators
2. Intrapersonal attitudes and emotions
3. Technical aspects of the meeting, including whether the client understood the statistical advice.

After reviewing 41 collaboration meetings in 2012-13, we were pleased to discover that these video coaching and feedback sessions still yield immediate benefits for the participants, who learn what to stop doing (e.g., speaking before thinking, excess fidgeting, being disengaged) and what to start doing (e.g., ask the client what she wants from the meeting, paraphrase the overall research goals). Repeated video sessions offer opportunities for LISA statistical collaborators to practice new techniques and to verify if they actually work in practice to improve statistical collaboration.

**Table 5.** Video Coaching and Feedback Session totals for 2012-13

	Fall 2012	Spring 2013	Summer 2013	Total
Videos Watched	23	18	0	41
Collaborators Reviewed	33	23	0	56 (49 unique)
Video Coaching and Feedback Sessions	23	18	0	41



Collaborators review a recorded meeting during a Video Coaching and Feedback Session.

## [30] Outstanding LISA Collaborator of the Year

LISA is pleased to announce that the 2012 Outstanding LISA Collaborator of the Year is **Jonathan Stallings**, a fifth year statistics Ph.D. student from Fredericksburg, VA.

LISA provides Virginia Tech faculty, staff, and students with high quality statistical support for their research. LISA's statistical collaborators are trained to help researchers design experiments; collect, analyze, and plot data; run statistical software; interpret results; and communicate statistical concepts to non-statisticians.

At the end of a collaboration project, clients are asked to complete a feedback survey about the quality of service they received and if they were satisfied. This survey provides clients the opportunity to nominate a graduate student statistical collaborator for the award as well as to provide feedback for the improvement for individual collaborators and of the collaboration service as a whole.



Jonathan  
Stallings

During 2012, LISA received 83 nominations for the Outstanding LISA Collaborator of the Year award.

Since joining LISA in fall 2011, Jonathan has worked on 85 collaboration projects. Clients attribute the successfulness of his meetings to his organization and preparation. Not only does Jonathan provide quality assistance to clients to help them solve their research problems, he serves as a mentor for

LISA associate collaborators and does an excellent job preparing them to become successful lead collaborators. In addition to his work on collaboration projects, he has also presented five short courses for the LISA Short Course series and has hosted Walk-In Consulting for four semesters.

Kelsey Brunton, a graduate student from agricultural and extension education, echoed the thoughts of many of Jonathan's nominators. "He was incredible to work with. He was very well organized and prepared for every meeting. He is very skilled at communicating statistical analyses to students who are not statisticians. He also incorporated and "coached" his partner with the LISA consulting. He had a genuine interest in my research and helping me succeed."



Jonathan Stallings assists Bireswar Laha a computer science doctoral student during LISA Walk-In Consulting.

Jonathan "went the extra mile to provide statistical insights and support" according to William Butler from engineering education. Jonathan's strong work ethic and genuine interest in client research has landed him four co-authorships including the lead author position on a paper with LISA Director Eric Vance and Ge Wang from the School of Biomedical Engineering and Sciences that was published in the prestigious *Proceedings of the National Academy of Sciences* entitled "Determining Scientific Impact Using a Collaboration Index".

## Outstanding LISA Collaborator of the Year [31]

Dr. Vance says, "Jonathan focuses first on what the client really wants to know. He makes sure he has a solid understanding of the clients' research questions before even thinking about statistics. Then he explains the statistical solution so that it's useful for the client and actually implemented. His work epitomizes the Fundamental Law of Statistical Collaboration: 'Seek first to understand, then to be understood.' That's one of the reasons he is so successful in applying statistics to help answer LISA clients' research questions.

There were three other finalists for the Outstanding LISA Collaborator of the Year award: **Nels Johnson**, **Caleb King**, and **Yiming Peng**. Below are a few quotes received from clients for each of these honorees.

**Nels Johnson** was the 2010 LISA Collaborator of the Year and continued to impress clients in 2011 and 2012, being a finalist each year. Nels is currently a Postdoctoral Fellow in the Department of Biology at Colorado State University. He worked on 164 LISA projects during his graduate career at Virginia Tech. Lynn Rallos, a graduate student from plant pathology, physiology, & weed science was pleased with Nels' assistance, "Nels was very patient with me. He was quick-thinking and with the way he communicated his thoughts to me, I was confident of his ability to work out the analysis." We are confident that Nels will be very successful in all of his future endeavors.

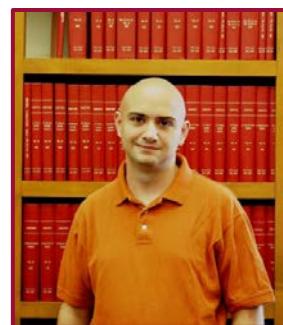
**Caleb King** is an active volunteer with both LISA and StatCom and is the current president of Mu Sigma Rho and the Director of the Student Outreach Seminar (SOS) Series. Sam Jennings, an instructional design and technology graduate student, remarked, "My two collaborators were phenomenal. Qing Li and Caleb King were absolutely wonderful and helpful. I want to thank both of them for their professionalism, insight, and support! What a great staff and wonderful resource for VT students!"

Clients are impressed with **Yiming Peng**'s dedication and hard work. Mark Rogers, a civil and environmental engineering graduate student, sees Yiming as an ideal collaborator; "I believe that all your collaborators should follow Yiming's example. And as a future researcher, I find it would be extremely helpful in the future to have someone like Yiming to work with." Mark added that "Yiming is an extremely valuable asset to any graduate student. I could not be more pleased or impressed with the quality of work and professionalism from Yiming Peng."

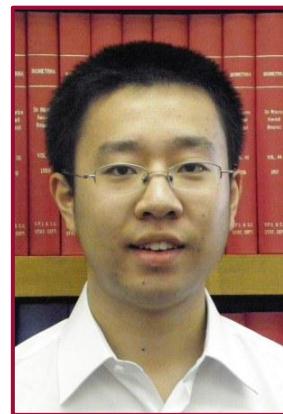
Honorable mentions in alphabetical order include **Khaled Bedair**, **Marcos Carzolio**, **Lulu Cheng**, **Mingqian Dai**, **Zaili Fang**, **Kelly Geyer**, **Andy Hoegh**, **Qing Li**, **Ying Li**, **Rimy Malla**, **Sarah Richards**, **Mark Seiss**, **Liang (Sally) Shan**, **Yu-Ming (Albert) Shen**, **Amy Tillman**, **Liaosa Xu**, **Chongrui (Ronnie) Yu**, and **Huaiye Zhang**.



Nels Johnson



Caleb King



Yiming Peng

## [32] StatCom

Statistics in the Community—StatCom for short—was first established by graduate students from the Department of Statistics at Purdue University in 2001 to provide professional statistical consulting services to non-profit and governmental organizations in the community free of charge. With the support of the American Statistical Association, StatCom now exists over an international network of colleges and universities, each with its own interpretation of how StatCom can serve their community. The graduate students in the Department of Statistics at Virginia Tech began a StatCom program in 2008 and promptly joined the growing StatCom Network.

In the past year, StatCom has established an ongoing collaborative relationship with a high school math and science magnet school, joined forces with the undergraduate stats club, and began constructing an advisory board for StatCom at VT.

- A short course focused on statistical analysis of small sample data was created and delivered to faculty at the Loudoun Academy of Science, a magnet school in Northern Virginia where each student is required to complete an undergraduate research project. Many of these projects result in small sample data sets for which traditional parametric tests are not appropriate. This class covered non-parametric tests and simulation based techniques. Additionally, specific cases will be discussed with StatCom members with they arise.
- The structure of StatCom is moving from a single student serving as a director to an advisory board with several interested students, including some undergraduates. This change will be finalized during the Fall 2013 semester.
- Outreach has been conducted through partnerships at VT Engage as well as a poster presentation at the 2013 Joint Statistical Meetings in Montreal.

For more information please visit: [www.lisa.stat.vt.edu/?q=statcom](http://www.lisa.stat.vt.edu/?q=statcom).



Andy Hoegh

The LISA 2020 Fellows selection committee announced on May 16, 2013 that after reviewing 108 applications, Olushina Olawale Awe from Obafemi Awolowo University, Ile-Ife, Nigeria was selected to serve as the first LISA Fellow. Awe travelled to Virginia Tech in August to begin his one year training.

The LISA Fellow position, which was advertised for less than a month, received 108 applications from 34 different countries. Applicants were rated based on their personal qualifications and passions, their university/institution's need for a statistical collaboration lab, and the support they will have in their home country to create and sustain a statistical collaboration laboratory. Six finalists were sent for outside review and comments.

Awe has been a statistician and lecturer at Obafemi Awolowo University for the past three years and is pursuing a PhD in Statistical Science at University of Ibadan, Nigeria. His enthusiastic application included a detailed plan for the development of a statistical collaboration laboratory modeled after LISA that included plans for training future collaborators. His hardworking nature was revealed through his impressive curriculum vitae and letter of support. Awe has a strong desire to collaborate with non-statisticians to improve research toward alleviating the most common societal problems in developing countries, especially Nigeria.

As the LISA Fellow, Awe will serve as a LISA Collaborator meeting with LISA clients—Virginia Tech faculty, staff, and student researchers—to assist them with designing experiments, analyzing and plotting data, running statistical software, interpreting results, and communicating statistical concepts to non-statisticians. In addition to collaboration meetings, he will teach three two-hour short courses that focus on helping graduate students learn to apply statistics in their research and will serve as a LISA Walk-in consultant to answer quick questions and to help with research projects requiring less than 30 minutes of assistance.

Awe will be trained to become a collaborative statistician so that when he returns to Obafemi Awolowo University, he will be prepared to create a statistical collaboration laboratory to help researchers, government officials, local industries, and NGOs apply statistical thinking to make better decisions through data.

LISA 2020 is a special project of LISA (Virginia Tech's Laboratory for Interdisciplinary Statistical Analysis) to educate and train statisticians and data scientists from developing countries to communicate and collaborate with non-statisticians and become collaborative statisticians. Our goal is to support these newly trained collaborative statisticians to create a statistical collaboration laboratory at their home university or institution and build a network of 20 statistical collaboration laboratories in developing countries by 2020.



## [34] Joint Statistical Meetings

LISA's methods for training statisticians to become interdisciplinary collaborators were on display during a technical session of the Joint Statistical Meetings (JSM) in Montreal, Canada in August 2013. Originally pitched as a panel discussion on the topic of, "Understanding and Improving the Non-Technical Aspects of Client-Consultant Interactions," the session became a mini-workshop for participants to learn how to analyze video-recorded statistical collaboration meetings to improve their own statistical collaboration skills. The main



message was that statisticians can use statistical thinking to collect (video record meetings) and analyze (video review) data to improve the process of statistical collaboration.



*Jonathan Stallings, Sandra Stinnett, Doug Zahn, Heather Smith, and Eric Vance*

The second part of the session consisted of a live coaching session between Dr. Zahn and LISA Lead Collaborator Jonathan Stallings. This live, impromptu coaching session focused on how Jonathan can better manage his anxiety when meeting with LISA clients by focusing on the clients' wants and needs and by staying focused on the present.



In the third part of the session, participants reviewed an additional video clip using the rubrics and discussed their findings in small groups. Through this exercise the participants practiced analyzing video clips and learned how they can apply this process to themselves and their colleagues in academia, government, and industry to improve their statistical collaboration skills.



Attendees expressed their enthusiasm for what they had learned during the session by requesting extra copies of the handouts and requesting soft copies to share with their colleagues.

The International Year of Statistics ("Statistics2013") is a worldwide celebration and recognition of the contributions of statistical science. Through the combined energies of organizations worldwide, Statistics2013 promotes the importance of Statistics to the broader scientific community, business and government data users, the media, policy makers, employers, students, and the general public.

The goals of Statistics2013 include:

- increasing public awareness of the power and impact of Statistics on all aspects of society;
- nurturing Statistics as a profession, especially among young people; and
- promoting creativity and development in the sciences of Probability and Statistics.

On April 18, 2013, LISA Director Dr. Eric Vance presented a special Department of Statistics Colloquium at Virginia Tech to celebrate the International Year of Statistics. This talk, "LISA 2020 and Ut Prosim: Building statistics capacity in developing countries," outlined the four-step LISA 2020 plan to create a network of 20 statistical collaboration laboratories by 2020.

For the third year in a row, LISA was featured in an invited JSM session in Montreal in August 2013. The session was titled, "International Statistical Consulting: Current Initiatives to Build Statistics Capacity in Developing Countries," and was chaired by Nilupa Gunaratna from Harvard University.

The first speaker, Jim Cochran from Louisiana Tech University, spoke about his efforts leading workshops to build statistics capacity in developing countries. Brian Hannon, an independent statistical consultant, spoke about some of his lessons learned consulting in 25 developing countries. Marcos Carzolio, gave an enthralling presentation about his experiences as an on-the-ground statistician in Mozambique. The audience was fascinated by his description of reviewing survey data and performing statistical analyses under a mango tree filled with monkeys on a laptop powered by a car battery. Marcos described how his job enabled the survey enumerators to collect high quality data, which he later analyzed to determine the impacts of the intervention to build handpumps in Mozambican villages without access to clean water. Part of the presentation was dedicated to Marcos's improvement as a statistician (building his statistics capacity), while working in a developing country.

The final presentation of the session was, "LISA 2020: Building statistics capacity in developing countries by training statisticians to communicate and collaborate with non-statisticians," by Dr. Eric Vance in which he excited the crowd with his vision of the future of the practical side of statistics.



Eric Vance, Brian Hannon, Jim Cochran, Nilupa Gunaratna, and Marcos Carzolio

## [36] On-the-ground statisticians return to Mozambique

Having learned from previous statistical collaboration projects that a useful analysis of survey data requires useful survey data, LISA sent two statisticians back to Mozambique during the summer of 2013 to work as on-the-ground statisticians for the Millennium Challenge Corporation's (MCC) Rural Water Supply Activity impact evaluation.

Dr. Ralph P. Hall from CAUS led the team in its job to evaluate the impact of the MCC's water project that drilled boreholes and installed handpumps in villages that lacked access to clean water.

In 2011, graduate student Mark Seiss and LISA Director Eric Vance traveled to Mozambique before the handpumps were installed to help design the baseline study; create a sample frame and a sample of communities that would or would not receive a handpump; write the survey questions asking households in the communities various questions about water, sanitation, health, education, and income; train the Mozambican survey enumerators; and ensure that they collected high quality data that could be statistically analyzed.

This past summer, Dr. Vance returned with graduate student Marcos Carzolio to help implement the follow-up study to see what changed in the communities that did or did not receive a handpump.

Once again, the work done in Blacksburg to determine which communities ought to be classified as treatments (having received a handpump) or comparisons (not receiving the handpump intervention) was mostly worthless. It wasn't until we had people on the ground (who took pictures of the

handpumps) that we learned whether or not a community actually got a handpump and therefore if those data should be considered as part of the treatment or comparison groups.

And once again, it was invaluable to include on the research team an on-the-ground statistician who understood the study design, the survey, and the data analyses options. As the on-the-ground statistician, Marcos's main job was to review the survey data and give feedback to the enumerators on a daily basis so that any data values that didn't make sense were double checked in the field within days of collection.



Dr. Eric Vance shows a family pictures he took of them during the baseline study in 2011.

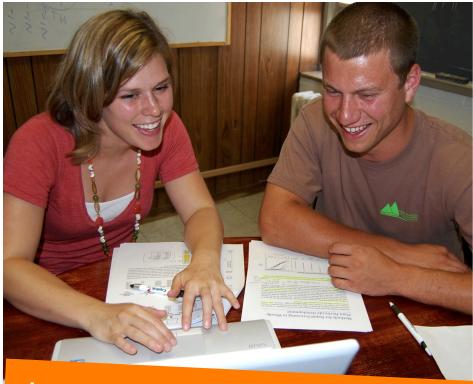
Because of the great work done by Marcos (and Mark before him), we have two excellent datasets, a baseline and a follow-up, that will enable us to determine the impact of installing handpumps in villages without access to clean water.

To learn more or to find out what the impacts of the water project actually were, follow the LISA blog at [www.lisa.stat.vt.edu/?q=blog](http://www.lisa.stat.vt.edu/?q=blog).



Marcos Carzolio explains the sampling plan to a Mozambican statistician.

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PhD student Marcos Carzolio (left) working as an on-the-ground statistician with a survey team leader in Mozambique

Visit [www.lisa.stat.vt.edu](http://www.lisa.stat.vt.edu) for more info about LISA

To learn more about applying, contact:

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# LISA

by Rosaire Bushey

In a top-tier research university like Virginia Tech, there is one thing you will find plenty of regardless of what program you examine: data. A lot of data.

To help manage the data that researchers develop through surveys and experiments, the Department of Statistics has the Laboratory for Interdisciplinary Statistical Analysis, or LISA. Formed in 1948 as the Statistical Laboratory, it was known from 1973-2007 as the Statistical Consulting Center. Since its name change and reorganization in 2008, the lab continues to offer more services to the university while also expanding to help development in other countries.

The director of LISA, assistant research professor Eric Vance, has laid out a comprehensive university mission for the lab as well as far-reaching goals as part of LISA's 2020 plan.

"Our mission within the university is to provide statistical service, research, and education," Vance said. "We do that in LISA by collaboration – which is at the heart of everything – getting researchers and statisticians to collaborate at the earliest points possible in the research process."

Vance explains that getting statisticians to collaborate with researchers and become a part of the research team provides a much richer and more fully utilized data set than simply having a statistician work on a project in an advisory capacity after the data have already been collected.

The method seems to be working. The program provided service to 186 clients during the 2005-06 academic year and more than 1,200 in 2011-12.

As the program matures and collaboration becomes more common, statisticians are also more often listed as co-authors. In 2011-12, LISA collaborators were co-authors in five peer-reviewed publications, 13 posters and presentations, and 14 manuscript submissions. The burgeoning partnership goes even further with more researchers including LISA services as line items in grant proposals.

"What we're doing here goes beyond building teams, we're building capabilities," Vance said. "By getting involved in the early stages of research, statisticians help researchers look at questions and po-



Computer science doctoral student Bireswar Laha of Calcutta, India, gets some help during walk-in hours from Jonathan Stallings, a statistics doctoral student working as a Laboratory for Interdisciplinary Statistical Analysis collaborator. Stallings has three co-authorships as a LISA collaborator, including one first-author listing and one publication in the Proceedings of the National Academy of Science.

tential data sets and separate those that will give the best data for the purposes of the research. When we get people who come to us late in the process, we find they've often spent a lot of time, effort, and money collecting data that doesn't add any real value to the research."

The staff at LISA is small. Vance and assistant director Chris Franck lead a team of faculty, graduate, and undergraduate students who take part as collaborators and provide counseling, statistical support, training, and help in the development of surveys and other data-gathering tools.

About 40 percent of the client base for LISA includes people taking one of approximately 25 short courses offered throughout the year. The other two-thirds of LISA clients are nearly equally split between walk-in consultations and collaboration efforts. But 90 percent of the LISA team's time is spent on collaboration.

The success of LISA, however, has brought its own set of issues, namely funding. The explosion in use of LISA services has nearly outpaced the ability of the program to fill lead collaborator positions and taxed the department's ability to provide walk-in client services. But feedback from clients proves LISA is making a difference.

Maj. Rewa Mariger, assistant commandant for recruiting with the Corps of Cadets, said using the free on-campus service has saved an estimated \$127,000 since 2008 and has helped the corps increase the size of its freshman cadet class by 44 percent in the same time-



Eric Vance, director of the Laboratory for Interdisciplinary Statistical Analysis, during his field work as an on-the-ground statistician in Mozambique, waits for an interview to finish regarding water usage in a rural village in Nampula, Mozambique.

frame. Other clients have said the soundness of the methodology used by LISA collaborators has given them greater credibility with editors of peer-reviewed publications and generally works to improve the credibility of Virginia Tech researchers.

## "What we're doing here goes beyond building teams, we're building capabilities"

- LISA director Eric Vance

service. But we've still got to clear the funding hurdle if we hope to continue to provide the level of service to a growing customer base."

A customer base Vance hopes to continue to grow is that of international statisticians through the LISA 2020 initiative. The plan proposes to train statistical collaborators from 20 different nations and send them back to their home universities to set up collaborative laboratories based on the LISA model.

"We'd like to have 20 collaborative laboratories set up outside the United States by 2020," Vance said. "It's an ambitious goal, but we think it's achievable."

In March the program won a Google Research Award, which will help fund the education and training of one statistician from a developing country for one year. While learning at Virginia Tech, the statistician will collaborate with non-statisticians and learn the methods taught through LISA.

"When they go back to their home universities, they'll set up a lab working under their local conditions based on their experiences here," Vance said. "A technically sound statistician can enable dozens of research projects each year and those projects, especially those involved in agriculture, can have a positive impact on thousands of people."

Because statisticians who work and live in research communities have a better understanding of what data sets can be, or have been, collected, they can more accurately and appropriately analyze data and give it meaning.

"At the international level, LISA is an *Ut Prosim* [That I May Serve] program," Vance said. "It will unlock the research potential of collaborators to help improve human welfare." 

## [40] Future Plans

In past years, LISA's primary goal was to become the premier academic statistical collaboration laboratory. Now our primary goal is to promote statistical collaboration worldwide. To that end, LISA will continue its efforts to provide high quality training for its students and faculty and high quality research, service, and education for clients at Virginia Tech and will help statistical collaboration laboratories at other universities to do the same. Our efforts toward continuous improvement in 2013-14 will focus on six points. Measurable goals are listed below for each point of focus.

### 2013-14 Goals

1. *Securing crucial additional—and permanent—funding for LISA.*
  - To keep pace with *current* demand, LISA needs funding for 6 lead collaborators; a director, assistant director, and administrative specialist; and for supplies, etc. A new faculty member partially supported from soft money could alleviate some of the challenges faced by the growth in demand for statistical collaboration. Permanent funding from Virginia Tech is important for planning and may be a prerequisite for winning large grants for LISA 2020.
2. *Continuing the momentum for LISA 2020.*
  - Begin training at least 3 LISA Fellows at Virginia Tech. Submit at least 4 grant proposals for LISA 2020 totaling more than \$100,000. Publicize the LISA 2020 program by giving at least 10 talks or posters at conferences and universities.
3. *Continuing faculty support and encouragement for statistical collaborations resulting in co-authored publications.*
  - Publish at least 10 papers from LISA collaboration projects co-authored by LISA students. Submit at least 15 manuscripts co-authored by LISA students.
4. *Recruiting high quality students to the statistics graduate program because they want to gain experience in LISA applying statistics to help people solve real world problems.*
  - At least 4 incoming students admit that LISA was a major deciding factor in choosing to attend Virginia Tech over somewhere else, and at least 2 say that if not for LISA they never would have applied to Virginia Tech.
5. *Maintaining the high quality of our collaboration meetings and Walk-in Consulting and continuing to improve the quality of our short courses.*
  - Maintain 95% or higher positive feedback from our collaboration clients. Video review every collaborator who regularly meets with clients at least once per semester. Begin collecting feedback from Walk-in Consulting visitors. Achieve an 80% or higher positive feedback rating from short course attendees.
6. *Promoting statisticians as collaborators within Virginia Tech.*
  - Collaborate with researchers from at least 60 departments at Virginia Tech. Give talks in at least 3 departments about the benefits of collaborating with statisticians.

**Webpage:** [www.lisa.stat.vt.edu](http://www.lisa.stat.vt.edu)

**Email:** LISA@vt.edu

**Facebook:** [www.facebook.com/Statistical.collaboration](https://www.facebook.com/Statistical.collaboration)

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