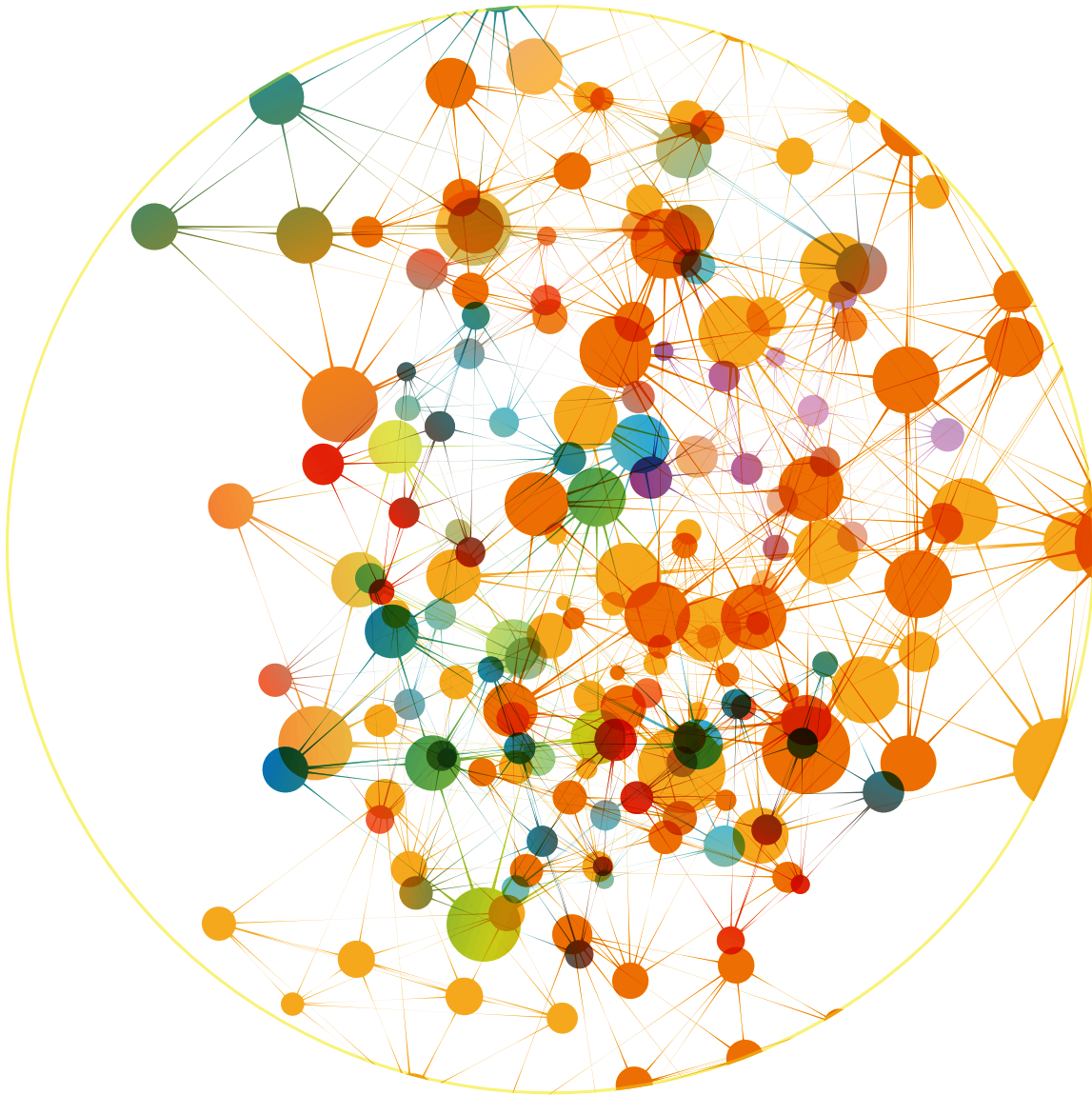


# M O M E N T S

Newsletter of the Virginia Tech Department of Statistics



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# Hello & Welcome

**W**elcome to the inaugural edition of Moments, the Virginia Tech Department of Statistics newsletter. As you'll read about in the pages of this newsletter, the department is continuing to grow and we're engaged in an incredible array of research and pedagogy. As of this writing, we have 34 faculty members, including the dean of the College of Science, **Sally Morton**. Since I've last written, the other new faculty members are: **Fred Faltin**, **Christian Lucero**, **Hamdy Mahmoud**, **Jen Van Mullekom**, and **Zhiyang Zhang**. And we're still growing: **Frances McCarty** and **J. Morgan Russell** along with potentially two more faculty members will be joining us in August. See the next edition of Moments for details.

I'm also very proud to report that the department continues to excel in all dimensions. Here are just a few highlights: **Hongxiao Zhu** was promoted to associate professor with tenure; **Leah Johnson** just won an NSF CAREER award (page 6); **Geoff Vining** was awarded an honorary doctorate from Lulea University and was made an ASQ Honorary Member; **Sally C. Morton** won the Janet L. Norwood Award for outstanding achievement by a woman in statistical sciences; **Xinwei Deng** won the *IISE Transactions* Best Paper Award on Quality and Reliability Engineering; **Tom Metzger** won the Conference on Statistical Practice Best Student Poster Award; **Inyoung Kim** and her former student, **Zaili Fang**, won Best Paper in *Biometrics* award; **Bobby Gramacy** won an award from Facebook's Academic Program; **Yili Hong** and his former student **Yuanyuan Duan** won the Wilcoxon Award; **Scotland Leman** and his former student **Andy Hoegh** won the Youden Award; **Maggie Mao** and **Danni Lu** won the SAMSI Summer Institute on Transportation Statistics Best Student Poster Award.

Finally, we are proud and humbled by the support of our friends and alumni. Via the generosity of **Jean Gibbons**, we have just admitted our first two Gibbons Fellows: **Annie Sauer** and **Tessa Anwyll**. This year, **Bob Schulman** established the Robert S. Schulman Enrichment Fund in Statistics, an endowment that will provide support to our department for the recruitment and retention of graduate students. And, on March 21st, the first ever Virginia Tech "Giving Day," 69 donors gave a combined total of \$5,620.18 to the department's annual fund.

What an amazing year it has been here in the Virginia Tech Department of Statistics!



Ron Fricker,  
Department Head



# SAIG

*Discussion with Jennifer Van Mullekom,  
Director of Statistical Applications + Innovations Group, formerly LISA*

## *What is the mission of SAIG and what inspired the name change?*

Our goal is to be the premier global statistical collaboratory by solving diverse, relevant problems while advancing University research partnerships as we transform students into leading practitioners of statistics and data sciences. We are interested in collaborating on projects in health care, banking and finance, insurance, consumer marketing, public policy, social science engineering and industry, etc. We have both depth and breadth in our collaborators, and can work on small scale and shorter term projects, as well as long term strategic ones.

The name change is reflective of our expansion to work with researchers across campus as well as external collaborators. SAIG has access to talented students and the entire statistics department faculty with their diverse research interests and applications areas.

## *What success factors contribute to an ideal collaboration?*

There are so many factors that contribute to an ideal collaboration. We train our collaborators in communication so that they can work with clients to define the research question, communicate an analysis plan, and interpret results in layman's terms. Additionally, our soft skills training has been expanded to develop collaborators who manage interactions and project work appropriately.

Yet, preparation on the part of the client is also key. If clients approach SAIG with a well-defined, well-scoped research or business question prior to collecting data, it increases the likelihood of a successful project. This is really about a dialogue and the ability to compromise in order to accomplish objectives.

## *What are you most excited about for the future of the program?*

I am most excited about the strategic partnerships being cultivated in health care analytics and in industrial manufacturing as well as grant applications under review. I see the ability to hire even more practicing statisticians to serve as mentors for student collaborators as these programs expand. Not only does this enhance experiential learning for the department, but it also serves to elevate the research reputation of the university through the application of sound study design, appropriate analytics, and intelligent interpretation of results.

## *Are there sponsorship opportunities/endowments if a company or alumnus would like to get involved with the program?*

If someone would like to honor their experience in SAIG (or previously in LISA), contributions to the VT Foundation can be designated in support of students in SAIG or other SAIG operations. Companies can also support SAIG via philanthropic gifts and by initiating collaboration projects; SAIG can serve as a valuable flexible resource for important but not urgent projects that companies lack the resources to complete.

Finally, we always welcome our corporate partners' direct involvement in SAIG. Sharing your experiences practicing statistics is one of the most valuable gifts you can give to our students. If you would like to support our students and programs, please contact Jen Van Mullekom through email ([vanmuljh@vt.edu](mailto:vanmuljh@vt.edu)) or phone (540-231-6244). Or, give a gift in support of SAIG at the university's online page: [givingto.vt.edu](http://givingto.vt.edu) (select *College of Science, other*, enter 'SAIG').

*Notable Alumnus*

# OLIVER SCHABENBERGER

*“Leadership is not about a managerial title. Leadership is learned and earned.”*



**A**s COO and CTO of SAS, Oliver Schabenberger sets the technology direction and executes the company’s strategic direction and business priorities. He oversees multiple divisions within SAS, including R&D, Sales, Marketing, Information Technology and Customer Support, as well as divisions focused on solutions for IoT, financial risk management and cloud.

Schabenberger joined the SAS R&D Division in 2002 and was named CTO in 2016. Prior to SAS, he served as Associate Professor of Statistics at Virginia Tech, where he earned his Ph.D. in 1995. He frequently writes on emerging technology for publications such as Forbes.com and holds several patents on software design and algorithms.

Above: Former VT Statistics faculty member and VT alumnus Oliver Schabenberger, COO & CTO of SAS.

## WHY VIRGINIA TECH?

I was finishing my Forest Science degree at the Albert Ludwigs University in Freiburg, Germany, and was starting to plan for a doctorate. I had developed an interest in Forest Biometry and attended a conference of the International Union of Forest Research Organizations (IUFRO). I listened to presentations from researchers from around the globe and was inspired to sharpen my biometry skills and realized that I needed to study mathematical statistics and probability.

The presenter who stood out to me at the conference was Prof. **Timothy G. Gregoire** of Virginia Tech. He presented a paper on sampling theory. There were five-fold summation signs on his transparencies, and he took us through a complex derivation of a certain sampling estimator. I did not fully understand or follow what he talked about, but I knew: *this is what I want to study* and *this is the person I want to study with*.

## WHAT WORDS OF ADVICE WOULD YOU GIVE TO TODAY'S STUDENTS?

We are living in a fast-paced world where change is constant and inevitable. In the field of technology, change and disruption continue to accelerate. You see and feel some of this in your line of work, a shift away from mathematical statistics and statistical modeling to data science, machine learning, and artificial intelligence.

Increasingly, tasks and decisions humans can make become the domain of algorithms and automated systems. This is an unstoppable movement and we have to find our place in a world that is increasingly driven by automation of cognitive skills. I am not afraid of the implications of automation and artificial intelligence, I see opportunities for better lives.

If we embrace lifelong learning, then we will grow with and benefit from disruption. I spent 25 of my first 30

years in classrooms. What I had learned then became largely irrelevant in the next decade.

I have no formal school or university training in computer design, software engineering, artificial intelligence, cognitive computing, management, business development and administration, organizational design, and so on. Yet those are the areas I have worked in since I finished schooling.

Don't plan too far ahead. Understand your short-term and longer-term goals, but also understand that uncertainty increases quickly with a longer horizon. I joined SAS as a software developer, which was exactly what I wanted to do—at the time. I had no specific plan to become a people manager, let alone a company executive. I could not have planned my career, but I would not trade it for any other.

## WHAT ARE THE KEYS TO SUCCESS IN TODAY'S WORK ENVIRONMENT?

Most important in my opinion is to have a growth mindset, a learning mindset. You need to spend energy on your job, but rather than spending energy to retain it, I recommend to spend energy to grow out of it.

Along the way, you will change not jobs but careers on average four times. Each position I have held has led me to the next one on my career path, thanks to the ancillary skills I developed along the way. I would never have predicted that I would be the COO of a software company, responsible for a workforce of 12,000 people, but here I am.

If I reflect on the attributes that are most important in my current job as a corporate executive, top of the list are curiosity, humility, empathy, authenticity, passion, and accountability. Communication skills are among the most important skills. We communicate every day,

*“If I reflect on the attributes that are most important in my current job as a corporate executive, top of the list are curiosity, humility, empathy, authenticity, passion, and accountability.”*

and not just through e-mails we sent or speeches we give. We communicate in the way we listen, in the way we empower, through body language, through our presence. Leadership is not about a managerial title. Leadership is learned and earned.

Please visit [stat.vt.edu/alumni](http://stat.vt.edu/alumni) for an extended version of this interview.

# LEAH JOHNSON AWARDED NSF CAREER GRANT

The Assistant Professor in Statistics seeks to improve quantitative models for fighting diseases in humans & trees

*Written by Steven Mackay for VT News*



Above: Assistant Professor of Statistics, Leah Johnson, 2018

**L**eah R. Johnson, assistant professor in the Department of Statistics, is using a \$700,000 National Science Foundation CAREER grant to improve mathematical and statistical models to help fight deadly diseases.

The vector-borne diseases that Johnson is targeting include dengue in humans and huanglongbing, commonly known as citrus greening, in fruit trees. The dengue virus, according to the U.S. Centers for Disease Control and Prevention, is spread by mosquitos and infects 400 million people per

year, mostly in tropical and subtropical climates. Huanglongbing — translated as “yellow dragon disease” — is a bacterial infection of citrus trees spread by small insects that cause leaves to wilt and, as the name indicates, fruit to become discolored.

“I’ve been working on models for vector-borne diseases for a few years now, focusing on improving how we include environmental factors, such as temperature, into mechanistic models of disease spread,” said Johnson. “Mostly I’ve concentrated on expanding existing simple models and better

incorporating sources of uncertainty.”

As part of her research, Johnson has been running a research collaboration network known as VectorBiTE, focusing on facilitating interactions between researchers in vector-borne diseases. The CAREER grant will allow her to take the effort further, both to improve the current models and start incorporating more detail and data.

“Infections such as dengue and Huanglongbing are data-rich, so we can test the models we develop against observations of transmission,” Johnson said. The grant also will allow Johnson to partner with scientists at the Virginia Department of Health’s Division of Environmental Epidemiology to develop improved tools for forecasting, planning, surveillance, and control of vector-borne diseases while simultaneously improving quantitative training for public health workers focused on vector-borne infections.

She hopes the work with the grant will lead to more projects. “Part of the excitement of this kind of project is that you get to spend time thinking about the really novel and interesting questions in our fields,” she added.

“I’d like to keep thinking about how environment impacts transmission of vector-borne diseases, but expand into other infections and insects. I’m especially curious about tick-borne infections. Ticks have pretty complicated and long lifecycles,

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*“Part of the excitement of this kind of project is that you get to spend time thinking about the really novel and interesting questions in our fields.”*

which makes building models for them more challenging, but I think it could be a lot of fun.”

Johnson is an affiliated faculty member of the Department of Biological Sciences and the Academy of Integrated Science’s Computational Modeling and Data Analytics program, all in the College of Science, and the Global Change Center at Virginia Tech, part of the university’s Fralin Life Science Institute. She earned a bachelor’s degree in physics from the College of William & Mary in 2001, and a master’s in physics in 2003 and doctoral degrees in applied mathematics and physics in 2006, all from the University of California Santa Cruz. Johnson joined Virginia Tech in 2016.

The CAREER grant is the National Science Foundation’s most prestigious award, given to creative junior faculty considered likely to become academic leaders of the future. Johnson is one of three College of Science faculty to receive a CAREER Award thus far in 2018, with the other recipients being Guoliang “Greg” Liu and Nick Mayhall, both assistant professors in the Department of Chemistry.



Above: VT Statistics alumnus Dr. Mahmoud Al-Said Mahmoud, Dean of Faculty of Economics and Political Science at Cairo University.

*“Analytical thinking and verbal & written communication are the most important skills in academia.”*

*Notable Alumnus*

# MAHMOUD AL-SAID MAHMOUD

**D**r. Mahmoud is currently Dean of Faculty of Economics and Political Science at Cairo University and is the youngest individual to attain this position. He obtained his Ph.D. in Statistics from Virginia Tech in 2004 and his bachelor and master of Science in Statistics at Cairo University in 1992, and 1997 respectively.

Dr. Mahmoud’s research interests are: Statistical Quality Control and Improvement and Multivariate and Regression Analysis. He has thirty-two refereed journal articles included in such journals as *Technometrics*, *Journal of Quality Technology*, *Journal of Applied Statistics*, and *Quality and Reliability Engineering International*. He currently serves on the editorial review board for *Quality and Reliability Engineering International*. In 2014, he was awarded the “Scientific Excellence in the Social Sciences Award” from Cairo University.

## HOW DID VIRGINIA TECH PREPARE YOU FOR YOUR CAREER?

I thoroughly enjoyed the opportunity to learn several statistical techniques and methods that helped me a lot in my career as a statistical researcher and professor. The knowledge I have gained helped me greatly in writing academic articles and publishing them.

Before I joined Virginia Tech I had only one published paper in a local journal. Now, I have published 32

articles in soundly recognized journals, including *Technometrics* and *Journal of Quality Technology*, with more than 1700 citations and an H-index of 17, as indicated by Google Scholar Website. This publishing record helped me a lot in the nomination process for the dean position of the Faculty of Economics and Political Science (FEPS), Cairo University. I am always proud to say that I am the first statistician to be named the dean of FEPS.



## WHAT MADE YOU CHOOSE VIRGINIA TECH FOR YOUR PHD? ---

When I was planning to apply for a Ph.D. program in Statistics in the year 2000, one of my Cairo University's colleagues, Alyaa R. Zahran, was studying in the Department of Statistics at VT. She strongly recommended I apply for the Ph.D. program in Statistics at VT since the professors there are highly recognized experts in their fields; for example, **Raymond H. Myers**. She mentioned that the professors there are publishing many academic papers in highly recognized journals and most of them wrote the textbooks for their courses. She also told me that the town of Blacksburg is a gorgeous area to live with lots of great recreation places and the cost of living is much cheaper than many other places in the states.

## WHICH FACULTY MOST INFLUENCED YOU? ---

Every single person I've met in the Department of Statistics at VT has influenced me in some way or another, but I can say that Professor **William H. Woodall** has most influenced me during my period of study. I am really indebted for his constant guidance and encouragement throughout the course of my study. I have benefited enormously from his moral support, insightful suggestions, and deepest experience in the field of statistical process control.

## WHAT SKILLS ARE CENTRAL TO SUCCESS IN TODAY'S ACADEMIC ENVIRONMENT? ---

I believe that analytical thinking and verbal and written communication are the most important skills in academia. A college student should have a well-conceived idea of what he/she wants to write the dissertation about before choosing the courses to study. Also he/she should seek the advice of several

professors, not just the initial advisor, on the best way to pursue academic and life interests at the early stage of the study.

## ARE THERE ANY DEPARTMENTAL STORIES FROM YOUR TIME HERE THAT YOU WOULD LIKE TO SHARE? ---

I would like to stress that I enjoyed the exposure to graduate study in the Department of Statistics at Virginia Tech. The supportive nature of the Department and classmates had made my studying enjoyable. Virginia Tech gave me a wide freedom to read and research the topic of my interest while doing my dissertation. The meetings with my advisor gave me a unique opportunity to learn closely from an esteemed professor.

One of my preferred activities during the years 2001-2004 was attending the Coffee morning every Wednesday. The members of the Statistics Department used to gather regularly at this time of the week to interact and chat with others. These were inspiring meetings for me.

In my first year of studying, a colleague once told me that I have to choose only two of the following three things in VT: get a high GPA score, get a healthy social life, get enough sleep. Thanks to god I have ended my Ph.D. program in 2004 and accomplished the three of them. I've kept my GPA very high and close to 4.0 all the four years of studying and published 5 papers during the period of study in highly recognized statistical journals including two papers in *Technometrics*. I also had a number of friends from the Department of Statistics and from Blacksburg Community. After graduation, I missed these friends dearly. Finally, I've gotten a reasonable amount of recreation and sleep.

# NEWS + EVENTS

## Hunter Conference

by Anne Driscoll, Assistant Professor of Practice

The sixth annual Stu Hunter Research Conference was held at the Hotel Roanoke and Conference Center in Roanoke, Virginia from Monday, March 5 to Thursday, March 8, 2018.

Named in honor of Stu Hunter, the conference is patterned after the Gordon Conference. The format consists of six invited, 90-minute talks each followed by extensive discussion. After the two principal discussants speak, every attendee is encouraged to participate in the general discussion. We enjoyed an impressive program this year with talks from the following people:

- **Dennis Lin**, Penn State, "Design and Analysis for Order-of-Addition Experiment"
- **Stephanie Kovalchik**, Tennis Australia, "Gaining an Edge: Promoting Statistical Thinking in the Sports Industry"
- **Sandy Fogel**, Virginia Tech Carilion School of Medicine, "Doctors are not pilots and patients are not airplanes: Quality improvement in medicine"
- **Laura Freeman**, Institute for Defense Analysis, "Design of Experiments for Reliability"
- **Geoff Vining**, Virginia Tech, "Soren Bisgaard's Contributions to Quality Engineering"
- **Ross Sparks**, CSIRO, "Disease surveillance: Disease counts or Time between disease events?"

It was also an honor to welcome the conference honoree Stu Hunter along with about 50 other participants, many of whom were fellow Hokies!



Above: Current and former Hokies with Stu Hunter. Of approximately 50 attendees, nearly 20 were current and former Hokies.



Above: Doug Montgomery (left) and Geoff Vining (right) with Stu Hunter.



Above (from left to right): Christine Anderson-Cook, Laura Freeman, Doug Montgomery, Blan Godfrey, and Ron Fricker.



## Join us at JSM 2018

Virginia Tech Statistics alumni, students, faculty, friends, and family are invited to join us on **Sunday, July 29th from 4 to 7 pm** for drinks and heavy hors d'oeuvres.

### **Rogue Kitchen & Wet Bar**

200 Burrad Street  
Vancouver, BC V6C 3L6  
(Convention Center location)  
roguewetbar.com

Please contact Annika Schmierer with questions: [schmiera@vt.edu](mailto:schmiera@vt.edu).

# SCHOLARSHIPS + AWARDS

## 2017-2018 Undergraduate Scholarship Recipients

### **Mahna Ghafari** CLYDE KRAMER SCHOLARSHIP

*Senior from Centerville, Virginia; Double major in Statistics & CMDA*

### **Annabelle Poston** JOHN H. KROEHLING SCHOLARSHIP

*Junior from Chesapeake, Virginia double majoring in Applied Computational Mathematics & Statistics with a minor in Actuarial Sciences*

### **Zorian Thornton** MARION & CHARLOTTE ECKERT SCHOLARSHIP

*Junior from Goochland, Virginia double majoring in Statistics & CMDA with minors in Math and Computer Science*

### **Abigail Good** MARION & CHARLOTTE ECKERT SCHOLARSHIP

*Junior from Glen Allen, Virginia majoring in Statistics with minors in Actuarial Sciences, Leadership & Social Change, and Gender, Science & Technology*

## Graduate Scholarship Recipients

### 2018 GIBBONS FELLOWS

**Annie Sauer** and **Tessa Anwyll** will join our program this fall. Annie received a B.S. in Applied Mathematics in May 2018 from Auburn University. Tessa received a B.S. in Mathematics in May 2014 followed by an M.A. in Mathematical Education in May 2015, both from Virginia Tech.

### 2017 AWARDEES

**Mohamed El Khouly** HINKELMANN AWARD

**Nathan Wycoff** HARSHBARGER AWARD

**Matthew Slifko** COSTAIN AWARD

**Zhihao Hu** HARSHBARGER AWARD

**Huiying (Maggie) Mao** COSTAIN AWARD

**Zhihao Hu** MYERS AWARD

**Thomas Metzger** ARNOLD AWARD

**Lata Kodali** BARTKO AWARD

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# CONGRATULATIONS CLASS OF 2018

