Fiscal Year 2014-2015
College of Science Annual Report

Department: _STATISTICS___________________

Research and Innovation (FY2014-15)

- **Research Expenditures**

  Number of grants: 34 new, 43 continuing, 31 submitted

  Amount of grants: over $18,490,084

  Research expenditures: $1,562,783

- **Notable new research awards in 2014-15 (incl. PIs, Amount, Title and Funding Agency)**


---

- **Faculty awards/honors in 2014-15** (e.g., Humboldt Fellowships, NSF CAREER awards, etc.):
  - Best Poster Award: “Senior Fitness-to-Drive Evaluation using Naturalistic Driving Study Data”, Feng Guo, Youija Fang, Jonathan Antin, The Fourth International Symposium on Naturalistic Driving Study
  - **Hong, Y.** – ISI elected member, International Statistical Institute (ISI), 03/2014
  - **Hong, Y.** – The Stan Ofsthun Award for the best RAMS paper in reliability engineering, Society of Reliability Engineering, 01/2015
  - **Hong, Y.** – Best Reliability Paper in Quality Engineering, ASQ Reliability Division, 05/2014
- **Woodall, W.H.** – W. L. Gore Lecture, University of Delaware, April 29, 2014. (included $3,000 honorarium)

- **Arnold, J.** (emeritus) – Southeastern Oklahoma State University Distinguished Alumni, September 17, 2014.

- **Hong, Y.** – PI for “Statistical Methods for Modern Reliability Data,” *DuPont Young Professor Grant*, $75,000, 08/15/2011-08/14/2014. 100% effort.

- **Number of manuscripts, number of books and book chapters (CY 2014); list high impact papers:**

  Number of publications 68

  Number of papers in press 50


- **Number of presentations (CY 2014); notable invited lectures:**
  - **Woodall, W.H.** – W. L. Gore Lecture, University of Delaware, April 29, 2014. (included $3,000 honorarium)

- **Links and support from university’s research investment institutes (Fralin, ICAT, ICTAS, ISCE, VBI, VTCRI, VTTI):**


7) **Zhu, H.** – ICTAS Junior Faculty Collaboration Award, Granting agency: Institute of Critical Technology and Applied Science at Virginia Tech (ICTAS), Effective dates: 07/01/2014 - 06/30/2015, Title: Breaking Boundaries on Information Encoding in Sonar and Radar, Role: PI, Amount: $120, 000 (My share: 75%)

8) **Zhu, H.** – VTCAR Seed Award, Agency: Virginia Tech Center for Autism Research (VTCAR). Title: Imaging Genomic Modeling in Autism Spectrum Disorder Study. Role: PI. Amount: $5,000 (My share: 80%). Effective Date: 01/01/2015 – 06/15/2015.

9) **Franck, C.** – R01AA021529-01A1 (Bickel/LaConte) NIH/NIAAA $17,454.54, Effort = 15% (1.80 calendar months) The Repair of Self-Control in Alcohol Dependence: Working Memory and Real Time fMRI.


- **Number of post-doctoral positions in STEM-H research areas:**

- **Examples of links with NCR for research into issues of security and resiliency:**

  Attended VT SURGE meeting in DC, Sallie Keller directs the SDAL lab.

Grants:

1. **Leman, S.** – Title: Early Model Based Event Detection Using Surrogates; P.I. N. Ramakrishnan (40%); Co-P.I.: **S. Leman** (15%), T.C. Lu (15%), M. Marathe (25%), M. Roan (5%); Sponsor: Intelligence Advanced Research Projects Activity (award 1141096); Amount: $14,494,495.00; Period: 4/2/2012 - 4/3/2015.


- **Examples of partnerships with external collaborators which have enabled VT to compete more effectively for external funding:**

**Corporate Partners Program**

The Corporate Partners program involves the following partners:

American Credit Acceptance
Capital One
DuPont
Eastman Chemical Company
Google
Eli Lilly
General Electric
Minitab
SAS
W. L. Gore & Associates
The Life of the Mind (FY2014-15)

- Faculty and departmental teaching awards (incl. college, university and national awards):

- Undergraduate student achievements and awards (e.g., Goldwater Scholars, Man/Woman of the Year):

- Graduate student achievements and awards (incl. college, university and national awards):

- Grants in undergraduate teaching and learning (e.g., PhysTec):
  2) Smith, E.P. Design and Development Award, STAT 4504. $12,000
  3) House, L. - Critical Thinking with Data Visualization (CTDV); $199,943 for 2013-2016; Principal Investigator; the National Science Foundation, Division of Undergraduate Education; #1141096
  4) Driscoll, A. Design and Develop Award for Individual Course Development. The award was funded by Networked Learning Design and Strategies (NLDS) for the amount of $11,542.10.

- Grants in graduate education (e.g., IGERTS):
One to two notable events or programs related to undergraduate education (e.g., first year of a signature course or FYE):

FYE for statistics undergraduates was offered this year to both Statistics and Economics majors. For 2014-2015, we changed the format of the class to meet twice a week rather than once and we helped out Econ my taking their students.

One to two notable events or programs related to graduate recruitment and/or education:

The proposed DAAS proposal moved forward, gaining support for the University Council and also from the Board of Visitors. The program will support the mission of the university in developing a quantitatively literate graduate student body and open doors for interdisciplinary collaborations.

We have a very active Corporate Partners Program where corporations (including American Credit Acceptance, Capital One, DuPont, Eastman, GE, Google, Gore, Lilly, Minitab, and SAS) sponsor student recruiting and provide scholarships for students. Our Corporate Partners, and other companies, visit us regularly as we are among their top choices for recruiting new hires and interns.

Examples of research experiences and experiential learning opportunities for undergraduates:

North, C. (in CS) used educational tools developed with funds from NSF # 1141096, with House, L. as PI.

Examples of international experiences for undergraduate students:

Examples of international experiences for graduate students:

Adam Edwards is spending six months in Africa helping Sokoine University of Agriculture develop a statistical collaboration center.

Ian Crandell is will complete a semester in Africa to support the development of collaboration centers.

Any additional examples that address goals in Virginia Tech’s “Plan for a New Horizon”:
Ways in which computational science and skills for managing and analyzing complex data sets are integrated across a wide range of disciplines
We developed STAT 2524, Data Science to be taught for the first time in Fall 2015.

Use of technology in classrooms and examples of distance-learning opportunities
We developed online versions of STAT 4504, 2004, 3604, 4604, 4214, and 4204.

Incentives for teaching and learning through distance education
Geoff Vining has taken responsibility for developing online versions of a number of our engineering statistics classes as well as several others.

Creation of flexible classroom spaces that fully support e-learning components
We have been developing versions of popular classes that operate with a flipped classroom approach.

Quality and availability of academic advising from orientation through graduation
House, L. and Robertson Evia, J. develop orientation packets, meet with students, response to emails, and attend orientation sessions for all new students.

Examples of STEM-related activities fostering entrepreneurship, science and technology policy, and ethics

The Virginia Tech Experience (FY2014-15)

Faculty service (Editorships, NSF/NIH program managers or panel members, leadership positions in professional societies):

Marco Ferreira

- Associate Editor of Bayesian Analysis, August 2009 – present
- Associate Editor of Brazilian Journal of Probability and Statistics, February 2015 – present
- Associate Editor of Journal of Statistical Distributions and Applications, December 2013 – present
- Savage Award Committee member, International Society Bayesian Analysis, August 2014 – August 2015
- Organizer of invited session, 2014 JSM Meeting, Boston, MA, 2014
Feng Guo

- Co-Chair, Data Analysis Committee. SAE Crash Data Collection and Analysis
- Vice-Chair, Transportation Statistics Interest group of American Statistical Association
- Member, the Transportation Research Board of National Academies Committee on Statistical Methods, (ABJ80)
- Member, the Transportation Research Board of National Academies Committee on Safety Data, Analysis, and Evaluation (ANB20)
- Member of the Transportation Research Board of National Academies Subcommittee on Traffic Surrogate Measures
- Expert reviewer: NCHRP 08-36/Task 115 Applicability of Fair Division, Data Envelopment Analysis and Conjoint Analysis Techniques to Program Funding Level and Project Selection Decision making
- Hosted three international visiting scholars in 2014, Professor Zhen Yang, graduate students Danni Lu and Qing Chen

Ina Hoeschele

- Associate Editor (AE) for Genetics, AE for Frontiers in Systems Biology, AE for BMC Genetics
- Jeffress Trust Awards Program in Interdisciplinary Research 2013 - 2015 Grant Cycle Review Committee member

Yili Hong

- Serves as an AE for Technometrics
- DOE proposal reviewer/panelist
- Referee for multiple journals such as JASA, Technometrics, AOAS etc.
- AE for ISBIS newsletters.

Leanna House

Reviewed papers in Journal of Statistics Education and VAST.
  o Invited to serve on program committee for 2015 IEEE Visual Analytics Science and Technology
  o Conference (VAST 2015)
  o Served on program committee for 2014 IEEE Visual Analytics Science and Technology Conference
  o (VAST 2014)
  o Reviewer for The ASA Section for Bayesian Statistical Science (SBSS) student paper award.

Inyoung Kim
Scotland Leman

- Computational Sciences program developer (2013)
  In the process of helping with the organization of an undergraduate Computational Modeling and Data Analytics (CMDA) program within the College of Science. The goal is to integrate various computational methodologies (computational statistics, applied mathematics, computational algorithms, modeling) in order to design a cohesive computational program which focuses on scientific applications and computational strategies for investigating such problems.
- Discover Analytics Center (DAC) member (2011-2015) Currently I serve as the statistical coordinator within the DAC, which is a joint analytical venture between the Departments of Statistics, Computer Science, Mathematics, and the Institute for Critical Technology and Applied Sciences. The DAC serves the greater Virginia Tech community in providing analytical services on a wide range of applications.
- Associate Editor: Decision Analytics (2012-Current)
  Decision Analytics is a peer-reviewed open access journal published under the brand SpringerOpen.

Eric Vance

- I am active in university governance and provide leadership in several areas, a few of which are listed below.
  - Faculty Senate
  - Commission on Faculty Affairs (developing policies governing tenure-track faculty members)
  - Commission on Outreach and International Affairs
  - University Council on International Affairs
  - (Library) Dean’s Advisory Council
  - Academy of Faculty Service Review Committee
- The more national committees I serve on the more I am asked to serve and provide leadership within those committees. I continued work on the ASA Committee on Applied Statisticians, Statistics Without Borders as vice-chair, and the Conference on Statistical Practice (CSP) Steering Committee. These and other professional leadership endeavors are listed below.
  - Served as chair-elect (2015 chair) of the ASA Section on Statistical Consulting (CNSL)
  - Active member of the ASA Committee on Applied Statisticians
  - ASA Council of Sections representative for CNSL
  - AAAS On-call Scientists
  - Vice-chair of Statistics Without Borders
  - Sigma Xi
  - Conference on Statistical Practice (CSP) Steering Committee
  - Faculty advisor for the international StatCom network
I am the faculty advisor for StatCom, a student-run group that provides pro-bono statistical collaboration for local non-profits and non-Virginia Tech researchers working on problems of interest to the local community. Also, the LISA 2020 program has significant teaching, research, and outreach components. I was a co-producer of the new Department of Statistics recruiting video.

Geoff Vining

• Professional Service
  o Member of the Board of Directors Representing the Divisions, American Society for Quality (2012-15).
  o Chair, Technical Communities Council, American Society for Quality (2013-2014)
  o Member, Advisory Board, Quality Engineering (2006 – Present)
  o Member, ASQ Publications Management Board (1997 – Present)
  o Member, Shewhart Medal Committee, American Society for Quality (2011-Present)
  o Member, William G. Hunter Award Committee, American Society for Quality Statistics Division (2012-Present)
  o Co-Founder and Co-Chair of the Management Committee, Stu Hunter Research Conference (2013-Present)
  o Program Reviewer, CSU-Dominguez Hills, MS and BS in Quality Assurance Program.

Bill Woodall

• Professional Service
  o Member of the Editorial Review Boards of the Journal of Quality Technology, Quality and Reliability Engineering International, and Quality Engineering.
  o Member of the American Society of Quality Deming Medal Committee.
  o Member of Advisory Board of Quality, Statistics, and Reliability Section of INFORMS
  o Reviewer for twenty-nine manuscripts:
    ▪ Communications in Statistics - Theory and Methods
    ▪ Frontiers in Statistical Quality Control
    ▪ International Journal of Physical Sciences
    ▪ International Journal of Production Research (2)
    ▪ Journal of Quality Technology (10)
    ▪ Journal of Statistical Computation and Simulation
    ▪ Mathematical Problems in Engineering
    ▪ National Research Foundation- South Africa
    ▪ PLoS ONE(2)
    ▪ Quality and Reliability Engineering International (2)
    ▪ Quality Engineering (2)
Hongxiao Zhu

- **Professional Service**
  - Served in the committee for 2015 SBSS student paper competition, and refereed 5 student papers.
  - Refereed one grant for NSA-MPS.

Anne Ryan Driscoll

- **Professional Service**
  - Member leader in the role of treasurer for the Chemical and Process Industries Division (CPID) of the American Society for Quality (ASQ) in 2014 and 2015.
  - Short-course chair for the Fall Technical Conference (FTC) representing the Statistics Division of ASQ. Responsibilities include organizing the four short courses offered at the conference.
  - Referred papers for *Communications in Statistics* and *International Journal of Production Economics*
Examples of economic development (e.g., industrial partnerships, patents):

Study Abroad programs:

PK-12 STEM programs:

Leanna House
- Aug 2012 Present, Curie mentor
- Aug. 2012-Aug. 2014, Faculty advisor for Stream Research, Education, and Management (StREAM) REU
- As part of the ICTAS-ICAT grant, I (with collaborators) developed and implemented a workshop for middle school children to explore data in The Cube.

Examples of Community and Student Engagement:

Scotland Leman
- Provided 3 media interviews
  - WSLS interviewed me concerning the movie The Imitation Game. This turned into a 2-minute blurb on the 5:30 news. http://www.wsls.com/story/27849889/former-virginia-tech-professor-portrayed-in-wwii-film-the-imitation-game

Jie Li
- My work on Tazewell county project is a good example of community engagement. The residents of Tazewell county were concerned about higher cancer rate in their residential area. Our team visited the county and meet with the authorities to understand their needs. We
submitted a proposal and received the grant from the county board to provide possible answers to
the concerns raised by the residents.

Jane Robertson Evia

- Committee Member, Women in Statistics, (August 10, 2012 - Present). I serve on the Women in
  Statistics committee, which explores issues related to females in the field of statistics.
- Committee Member, College of Science Diversity Committee, (August 20, 2014 - Present).
  Serve as member of the committee to help increase diversity in the College of Science.
- Faculty Mentor, International Student Orientation, (August 19, 2014). Helped international
  students get oriented to VT, the COS, and the Department of Statistics. Helped students register
  for classes and plan their academic plan during their time at VT.
- Faculty Mentor, Freshman Orientation, (July 9, 2014 - July 23, 2014). Helped freshman students
  get oriented to VT, the COS, and the Department of Statistics. Helped students register for
  classes and plan their academic plan during their time at VT.
- Faculty Mentor, Transfer Orientation, (June 23, 2014). Helped transfer students get oriented to
  VT, the COS, and the Department of Statistics. Helped students register for classes and plan their
  academic plan during their time at VT.
- Faculty Sponsor, Statistics Club at VT, (August 20, 2014 - Present). Provide guidance for
  Statistics Club board as needed.
- Faculty Sponsor, Roc Solid Foundation at VT, (November 20, 2013 - Present). I serve as the
  faculty sponsor for the Roc Solid Foundation at VT. This is a student foundation that raises
  money for and builds play sets for children with cancer.
- Committee Member, Quantitative and Computational Thinking Committee, (January 14, 2014 -
  April 20, 2014). Served on the committee to help determine quantitative and computational
  thinking learning outcomes for the potential new version of the existing CLE.
- Member, Dialogue on Race. The Dialogue on Race committee focuses on race issues and
  increasing diversity in the New River Valley. I serve on the Increasing the Presence of African
  Americans subcommittee. (January 19, 2013 - Present).

Eric Vance

- The more national committees I serve on the more I am asked to serve and provide leadership
  within those committees. I continued work on the ASA Committee on Applied Statisticians,
  Statistics Without Borders as vice-chair, and the Conference on Statistical Practice (CSP)
  Steering Committee. These and other professional leadership endeavors are listed below.
  o Served as chair-elect (2015 chair) of the ASA Section on Statistical Consulting (CNSL)
  o Active member of the ASA Committee on Applied Statisticians
  o ASA Council of Sections representative for CNSL
  o AAS On-call Scientists
  o Vice-chair of Statistics Without Borders
  o Sigma Xi
  o Conference on Statistical Practice (CSP) Steering Committee
  o Faculty advisor for the international StatCom network
- AAAS Section U
- Reviewer for CSP Posters
- Reviewer for CIDER Conference on Higher Education Pedagogy

- I am the faculty advisor for StatCom, a student-run group that provides pro-bono statistical collaboration for local non-profits and non-Virginia Tech researchers working on problems of interest to the local community. Also, the LISA 2020 program has significant teaching, research, and outreach components. I was a co-producer of the new Department of Statistics recruiting video.

Anne Ryan Driscoll

- Faculty Mentor, Women Inspiring the Next Generation to Soar (WINGS) (2014). Part of a panel to provide a support network for collegiate women in engineering, to prepare them for key transition points throughout their collegiate careers and into the business world, and to empower them to fulfill their potential.

➢ International collaborations and programs (include description along with region and country):

Jane Robertson Evia and Leanna House

- Faculty Mentor, International Student Orientation, (August 19, 2014). Helped international students get oriented to VT, the COS, and the Department of Statistics. Helped students register for classes and plan their academic plan during their time at VT.

Eric Vance

- Principal Investigator – LISA 2020 Year 2: Building Statistics Capacity in Developing Countries to Solve Real-World Problems. Google Faculty Research Awards, $20,000 (100% credit), 09/2014 – 12/2015.
- Travel to OAU in Ile-Ife (Osun State) and the University of Ibadan to help promote LISA2020
- Student Ian Crandell went to Africa the summer to support statistical collaboration activities

LISA 2020 is a program started by 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 nonstatisticians and become collaborative statisticians. Our program includes supporting these newly trained collaborative statisticians to create and run a statistical collaboration laboratory at their home university or institution to build a network of 20 statistical collaboration laboratories in developing countries by 2020.

Each of the newly created laboratories in the LISA 2020 network will foster education in statistics and will promote the proper application of statistics to solve realworld problems. With a strong support network, just one statistician trained to communicate and collaborate with nonstatisticians can enable
and accelerate 50 or more research projects per year. Each research project can impact hundreds or thousands of people. In 2013-14 LISA 2020 received funding from a Google Faculty Research Award and the USAID sponsored Innovative Agricultural Research Initiative (iAGRI) program to train three LISA Fellows (Olawale Awe, Dr. Benedicto Kazuzuru, and Emanuel Msemo) to become collaborative statisticians.

- Any additional examples that address goals in Virginia Tech’s “Plan for a New Horizon”:
  - Partnerships with businesses and government that “address critical and complex problems by co-locating researchers and practitioners in ‘living labs’ where users, in partnership with researchers, drive problem formulation and research design”
  - Examples leveraging the strengths of our business programs to provide a competitive advantage
  - Examples of strategic global investment, development of research programs on energy and critical technologies, informatics, infrastructure, policy and planning at VT’s international centers

**Diversity (FY2014-15)**

- Any notable activities by students, faculty and/or staff activities promoting diversity:

Jane Robertson Evia

- Committee Member, College of Science Diversity Committee, (August 20, 2014 - Present). Serve as member of the committee to help increase diversity in the College of Science.
- Faculty Mentor, International Student Orientation, (August 19, 2014). Helped international students get oriented to VT, the COS, and the Department of Statistics. Helped students register for classes and plan their academic plan during their time at VT.

Eric Vance
I lead diversity related initiatives through the LISA 2020 program, the mentoring programs I have developed for the ASA Committee on Applied Statisticians, the 2014 CSP Mentoring Program, the 2014 JSM Mentoring Program, and my recruiting efforts for the Department of Statistics.

➢ Diversity awards and honors (e.g., MAOP scholarships; McNair Scholars):

Tonya Pruitt, administrative specialist for the Laboratory for Interdisciplinary Statistical Analysis in the College of Science at Virginia Tech, has received the university's 2014 President's Award for Excellence.