College of Science 2011-2012 Annual Report

Department: _STATISTICS_______

Learning: “The Life of the Mind”

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

  M. Lemos received CIDER Thank a Teacher Recognition

  M. Lemos and B. Woodall received the 2012 Favorite Faculty Award sponsored by the Housing and Residence Life Department of the Office of Student Affairs.

  M. Lemos received the 2012 Pan-Hellenic Community of Virginia Tech Award for Excellence in Teaching and Community Service.

- 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):

  John Szarka received the Mary G. and Joseph Natrella Scholarship from the Quality and Productivity Section of the American Statistical Association. The award is given for research contributions to the field of quality control.

- Grants in undergraduate teaching and learning (e.g., PhysTec):

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

**Kim, D.** (Core Faculty) – Interdisciplinary Graduate Education Program (IGEP) for Remote Sensing. The Graduate School, Virginia Tech. 2012-2015.

Examples of research experiences and experiential learning opportunities for undergraduates:

M. Lemons, Summer & Fall 2011, project with undergraduate Statistics major, Stephen Goode; student earned xxx credits of STAT 4994

C. Franck, Summer & Fall 2011, project with undergraduate Statistics major, Kelly Geyer, through VBI undergraduate research program; student earned xxx credits of STAT 4994

L. Williams, faculty mentor for four students working on internships in Summer 2011; students earned 3 credits STAT 4964; Allison Moore, Elisabeth Kimball, Kim Roepe, Carson Moorefield

M. Lemons, faculty mentor for one students working on internships in Summer 2011; students earned 3 credits STAT 4964; Jason Dods

Kelly Geyer was hired as a LISA (Laboratory for Interdisciplinary Statistical Analysis) associate collaborator. In fall 2011 she worked on 4 collaborative projects. In spring 2012 she worked on 4 collaborative projects.

Undergraduates in STAT 4984 “Communication in Statistical Collaborations” completed final projects in which they found a researcher who wanted help with statistics, met with them to understand the scientific problem, applied their statistical knowledge to help the researcher solve the problem, and communicated the statistical solution to the researcher.

Examples of international experiences for undergraduate students:

L. Williams, advised undergraduate student about courses to take during Study Abroad experience at University of South Wales; Isabel Navarro

Examples of international experiences for graduate students:

Mark Seiss spent the summer in Mozambique as an *on-the-ground statistician* to ensure that the research data collected for the grant “Impact Evaluation for the Millennium Challenge Corporation-Supported Rural Water Investment in Mozambique” were of high quality. The project was supported by Dr. Eric Vance and Dr. Ralph Hall.
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.

  The Department of Statistics, in collaboration with Computer Science, introduced two courses on data analytics.

  Through coursework, mentored research, and experience in LISA, we are producing graduates who possess superior analytical, critical thinking, management, and communication skills and who excel at abstract and computational thinking.

- Use of technology in classrooms and examples of distance-learning opportunities

- Incentives for teaching and learning through distance education
  2. Williams, L. – Virginia Tech Provost Course Development Fund Grant (Online version of STAT 4706), December 2011.

- Creation of flexible classroom spaces that fully support e-learning components

- Quality and availability of academic advising from orientation through graduation

  L. Williams, attendance at COS advisor meetings each semester

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

**Research and Innovation**

- Faculty awards/honors (e.g. Humboldt Fellowships; NSF CAREER awards, etc):

  1. W. Woodall will be the Honoree at the Quality and Productivity Research Conference to be held in Long Beach, CA in June 2012.
2. **G.G. Vining** received the 2010 Shewhart Medal (awarded in 2011), the ASQ career award given annually to the person not previously so honored who has demonstrated the most outstanding technical leadership in the field of modern quality control, especially through the development to its theory, principles, and techniques.

3. **G.G. Vining** received the 2011 William G. Hunter Award by the American Society for Quality Statistics Division for excellence in statistics as a communicator, a consultant, an educator, an innovator, an integrator of statistics with other disciplines, and an implementor who obtains meaningful results.

4. **G.G. Vining** received a 2011 NESC (NASA Engineering Safety Council) Group Achievement Award for the Composite Overwrapped Pressure Vessel (COPV) Reliability Analysis Subteam: in recognition of outstanding contributions in the cross-functional problem-solving and methods development during this task. Also receiving the award were two people who worked on the project as graduate students, Laura Freeman and Matt Williams.

5. **P. Du** was nominated as an Elected Member of the International Statistical Institute

6. **Y. Hong** received the DuPont Young Professor Award, DuPont, 06/2011

7. **Y. Hong** received the International Travel Supplement Award ($1,200), Virginia Tech, 05/2011

Notable new research awards in 2011-12 (incl. PIs, Amount, Title and Funding Agency)

1. **Franck, C.F.** (PI McCoy) – Promote sustainable and affordable housing through adoption and diffusion of green building, HUD – Sustainable Communities Research Grant (SCRG). 1/2012-1/2014.


4. **Vance, E.A.** (PI Tom Campbell, ICTAS) – A Carbon Nanotube Metrology System for Counterfeit Detection. ADA Technologies. This grant provided funding for LISA for statistical collaboration from Dr. Anne Ryan, Dipayan Maiti, and Dr. Eric Vance. 11/10-10/11
5. **Vance, E.A.** (PI Laurie Fox, Hampton Roads AREC) – 2011 Sustainable Landscape Survey. This grant provided funding for LISA for statistical collaboration from Dr. Eric Vance. 2/11-6/11

6. **Vance, E.A.** (PI Clay Gabler, SBES) – New Jersey Teen Driving. This grant was to provide funding for LISA statistical collaboration, directed by Dr. Eric Vance.

7. **Smith, E.P. and Vance, E.A.** (PI Mary Marchant, Department of Agricultural and Applied Economics), Food and Agricultural Education Information System (FAEIS), USDA/NIFA. 9/11-9/12


12. **Hoeschele, I.** (sub-contract PI), Liu, Y. (PI) – Genetic determinants of visceral adiposity: A genome-wide association study. *NIH (5R01AG032098)*, $100,136. Subcontract PI for the period 02/01/11-1/31/12 to perform a genome-wide detection and association study of copy number variation.


15. Ramakrishnan, N., Leman, S.C., Chang Lu, T., Marathe, M., and Roan, M. – Early Model Based Event Detection Using Surrogates, *IARPA, OSI* (Funded, $14,494,495.00 @ 15% Credit).


- Number of manuscripts, number of books and book chapters (CY 2011); list high impact papers:

  54 papers, 1 book and 1 book chapter.

Notable papers include


- Number of presentations (CY 2011); notable invited lectures:


5. Ralph Hall, Jennifer Davis, Kory Russel, **Eric Vance, Mark Seiss,** “Results from the Baseline Study of the MCC-Funded Rural Water Supply Activity in Nampula.” Presented in December 2011 at the Millennium Challenge Corporation headquarters in Washington, DC.


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

**VBI links**


8. **Hoeschele, I.** (Co-PI), Gao (PI) – Haplotype and QTL mapping in pedigrees with missing data. *NIH (1R01GM073766-01A2),* $177,582 (Hoeschele portion; Total: $1.1 Mill), 06/01/07-05/31/12.

9. **Hoeschele, I.** (sub-contract PI), Liu (PI) – Epigenome-wide association study of DNA methylation and atherosclerosis. *NIH (1R01HL101250-01),* $559,641 (Hoeschele portion; total: $3,763,104), 09/01/09-07/31/14.

**VTTI links**

1. **Guo, F.** (Co-PI) – A Trip Level Analysis of Driver Distraction Using 100–Car Study Database. *Insurance Institute of Highway Safety,* $284,252 (50% effort).


**VTCRI links**


**VTCSOM (Virginia Tech Carilion School of Medicine) links**


2. **Kim, D.** Leads the Health Services Research (HSR) group consisting of VT and VTCSOM faculty members and serves as a coordinator for HSR Seminar Series (2011-present)

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

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

2. Ramakrishnan, N., Leman, S.C., Chang Lu, T., Marathe, M., and Roan, M. – Early Model Based Event Detection Using Surrogates, *IARPA*, OSI (Funded, $14,494,495.00 @ 15% Credit).

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

1. Ramakrishnan, N., Leman, S.C., Chang Lu, T., Marathe, M., and Roan, M. – Early Model Based Event Detection Using Surrogates, *IARPA*, OSI (Funded, $14,494,495.00 @ 15% Credit).

**Engagement: “The Virginia Tech Experience”**

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

Feng Guo:
- Member of the Transportation Research Board Committee on Statistical Methods, (ABJ80)
- Member of the Transportation Research Board Committee on Safety Data, Analysis, and Evaluation (ANB20)
- Member of the Transportation Research Board subcommittee on Traffic surrogate measures

Leigh Williams:
- American Statistical Association, Section on Statistical Education, Member-at-Large Executive Board position, January 2011 – current (3 year term)

Ina Hoeschele
- Associate editor for *Genetics and Frontiers in Systems Biology*
• NIH Special Emphasis Proposal Review Panels
Yili Hong
• Served on the Technical Committee for the Seventh International Conference on Mathematical Methods in Reliability.

Inyoung Kim
• Program committee Bioinformatics 2011 (“International conference on Bioinformatics Models, Methods and Algorithms”)

JP Morgan
• Associate Editor, *Journal of Statistical Planning and Inference*. Handled eight (8) papers submitted during 2011.
• Associate Editor, *The American Statistician*. Handled eight (8) papers submitted during 2011.

Eric Smith
• Member of EPA Science Advisory Board Animal Feeding Operation Emission Review Panel
• Associate editor for Encyclopedia of Environmetrics

George Terrell
• Associate Editor of the *Journal of Computational and Graphical Statistics*

Geoff Vining
• Elected Member of the American Society of Quality Board of Directors Representing Divisions (2012-13)
• General Conference Chair, 2011 Quality and Productivity Research Conference, Roanoke, Virginia
• Co-Chair, Publications Management Board, American Society for Quality
• Member, Advisory Board, Quality Engineering
• Group Facilitator, Division Affairs Council, American Society for Quality
• Member, Shewhart Medal Committee, American Society for Quality

Eric Vance
• Elected to the ASA Council on Sections as representative from the Section on Statistical Consulting.

Bill Woodall
• Member of the Editorial Review Boards of the *Journal of Quality Technology* and *Quality Engineering*
• ASQ Selection Committee for new Editor of *Journal of Quality Technology*
• Member of the American Society of Quality Deming Medal Committee
• Member of Advisory Board of Quality, Statistics, and Reliability Section of INFORMS

➢ Examples of economic development (e.g., industrial partnerships, patents):
Study Abroad programs:

PK-12 STEM programs:

L. Williams, July 2011, organized visit to Stat department by high school students attending Governor's School summer program in statistics class at Lynchburg College; undergraduates Kelly Geyer and Stephen Goode spoke about undergraduate research experiences; Dr. Eric Vance spoke about consulting experience in Africa

Examples of Community and Student Engagement:

StatCom is short for Statistics in the Community. It is a student-run organization that provides pro bono statistical consulting and collaboration for local non-profit organizations and non-Virginia Tech researchers of local interest. StatCom worked with Dr. Carolyn Thomas from Ferrum College, the director of the Smith Mountain Lake Water Quality Monitoring Project and the Claytor Lake Water Quality Monitoring Project. StatCom member Kelly Geyer wrote a report concerning some regression analysis relating various measures of lake health to the distance from the dam at Smith Mountain Lake. StatCom member Elaine Nsoesie has been investigating methods for analyzing bacteria content in Smith Mountain Lake. Matt Williams provided some exploratory plots for spatial analysis of the data collected at Smith Mountain Lake.

2010-2011 was the first year working with Ann Angert, planning director of New River Community Action. StatCom was asked to help enter data for a census of the homeless in the New River Valley area of Virginia. StatCom member George Rooney has been working on the project, which is still in the organizing phase.

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<thead>
<tr>
<th>Students</th>
<th># of Projects</th>
<th># of Hours</th>
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<tbody>
<tr>
<td>Kelly Geyer*</td>
<td>3</td>
<td>90.75</td>
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<td>Nels Johnson</td>
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<td>Elaine Nsoesie</td>
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<tr>
<td>George Rooney*</td>
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<tr>
<td>Matthew Williams</td>
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*undergraduate student

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

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**

- One to two notable activities by students, faculty and/or staff activities promoting diversity:
  - Marlow Lemons is on the College of Science Diversity Committee – Recruiting undergraduate and graduate students to Virginia Tech to pursue undergraduate studies in our department by visiting predominantly minority universities.
  - Leanna House organized breakfasts or lunches for women in statistics at VT. They discuss specific issues that women in the department face or may face and provide information on scholarships and/or research/career resources available to women.

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