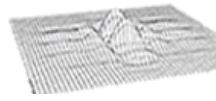




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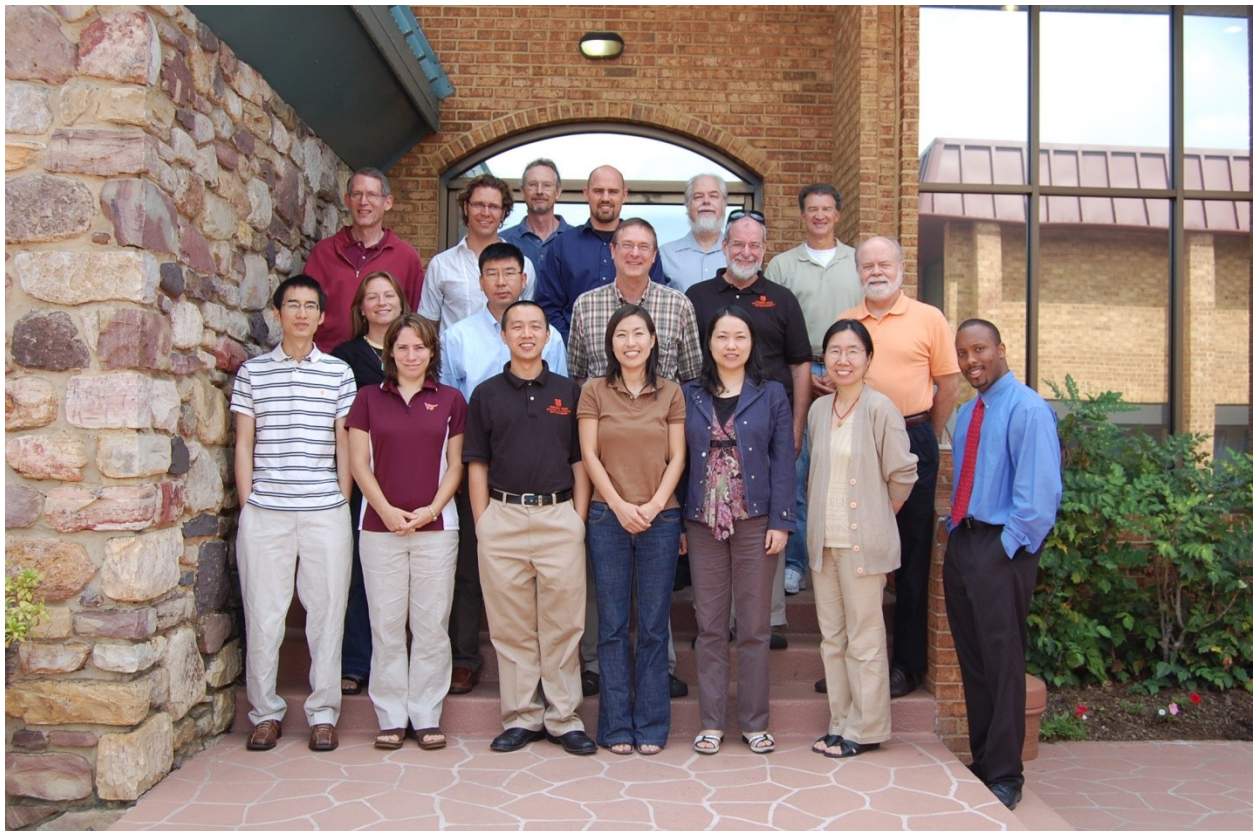


Fall 2009, Volume 7

www.stat.vt.edu

Department of Statistics Newsletter

Fall 2009



Greetings from the Department Head, DR. ERIC SMITH

Like other departments at state universities we have had to make another round of budget cuts that limit our ability to maintain strong undergraduate and graduate programs. We face increasing enrollment in our classes and pressures to eliminate smaller graduate classes. I'm pleased to report however, we have been able to continue to grow our program and have had a very productive year in terms of publications and funded research.

Thanks to your support our graduate program continues to improve and expand. Last year we graduated 15 Master's level students and 3 Ph.D. students. Our graduate students (we now have 66) continue to be rewarded for their work. **Laura Freeman** was named the Graduate Woman of the Year, to recognize her research and service to the university. She also received a second fellowship from the Amelia Earhart Foundation and a Virginia Space Grant Award. **Denisa Olteanu** was awarded the Mary G. and Joseph Natrella Scholarship from the Quality and Productivity Section of the American Statistical Association. Our recruiting efforts continue to benefit from the devotion our graduate coordinator, Jeff Birch; the financial support from our Corporate Partners program; and staff support from Christina Dillon. This fall we add 20 new students to our program.

Our undergraduate program graduated 14 in the spring graduation ceremony. Leigh Harrell continues her efforts to improve the program. Our Actuarial Science minor has been successful and already has 24 students. Our freshman class includes four new students, and we are adding three transfer students to our undergraduate program.

Our new Laboratory for Interdisciplinary Statistical Analysis (LISA) has been quite successful as a program for supporting faculty, staff and student projects. This year we added a series of short courses to the program. We also have implemented a successful walk-in service. Thanks to the generous support of the Provost, Research Division, Graduate School, College of Science and the other colleges, we are able to provide the service and help train our students in statistics collaboration and consulting. See <http://www.lisa.stat.vt.edu> for more details.

The department hired **Yili Hong**, a graduate of Iowa State University, as a new faculty member. Yili brings expertise in reliability, quality control and industrial statistics. If you look in the May 2009 issue of *Technometrics*, you'll notice part of his dissertation work that was published with his advisor, Bill Meeker. We look forward to his arrival and contributions to strengthening our industrial statistics program. This brings the total number of faculty to 20.

The department was saddened by the loss of IJ Good who passed away at age 92. His genius, wit and insights will be missed. Some of his numerous obituaries may be found on our web page.

Finally, we have had some success in helping students through foundation contributions. Generous contributions have allowed us to initiate an award to honor **Ray Myers**. The **Jean Gibbons** award is in

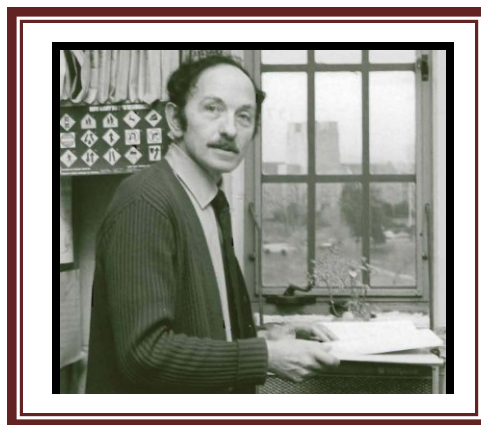


its second year and provides money to enhance the education of a top graduate student. We are however facing continued financial stress and hope that you are able to help support our programs. Opportunities to contribute to various scholarships are described on the last page of the newsletter. Contributions to the general Statistics fund are also welcomed. And, don't forget to stop by for a visit if you are in the area. We'd love to hear about how you have done since we saw you last.

Irving John Good (1916-2009)

University Distinguished Professor Emeritus I. J. Good died April 5 at the age of 92. It's always sad when a member of our academic family passes away, and so it was in the case of Jack, who was a jewel of the department (as well as the university and the discipline) for more than 40 years.

A child prodigy in mathematics, Jack earned multiple doctoral degrees at Oxford and Cambridge under G.H. Hardy and A. S. Besikovitch. Along with several of his fellow British chess champions, he was recruited to join the cadre of Bletchley Park codebreakers that cracked the Enigma and other ciphers during World War II. Working closely with Alan Turing, generally recognized as the father of the computer (Google *Turing Machine*), they built the first electronic computer and used it to apply Bayesian methods to the decryption of messages whose translation table changed with each letter of each transmission. All of this was top secret until 1972 (five years after his arrival at Virginia Tech), and some of it remains secret to this day.



Jack was a pioneer of the neo-Bayesian revival that sprouted after WWII. His first book, *Probability and the Weighing of Evidence* (1950), was among the first axiomatic developments of Bayesian probability and statistics, influenced by Harold Jeffries, anticipated in Italian by Bruno de Finetti, but preceding the better known American book by Jimmy Savage (1953). He was also known for a broad range of publications in several other areas—the Fast (Discrete) Fourier Transform, information and signal theory, computation, number theory, psychology, philosophy of science, and science fiction. Early on he predicted the increase in speed and decrease in size of the electronic computer, and he proved to be rather accurate about the rates of those changes. Soon after his arrival at Virginia Tech in 1967, as a result of his prediction of the development of ultra-intelligent machines, he was invited to Hollywood to spend a day with director Stanley Kubrick, playing chess and consulting on the filming of Arthur C. Clarke's *2001, A Space Odyssey*.

A comprehensive view of Jack's contribution can be found via his departmental web page (<http://www.stat.vt.edu/facstaff/ijgood.html>), including excellent obituaries from the *Times* of London and the *Daily Telegraph*, a personal [interview](#) by David Banks, Jack's C.V. and "[shorter](#)" [publication list](#).



I'll close with some less formal local takes. Bringing Jack to VT was a coup for Boyd Harshbarger, the founder of our department and the head at that time. Legend has it that Jack was the highest paid person on campus at that time, including the president. The rank of University Distinguished Professor was established shortly after his arrival, and he was among the first two. His colleagues in the department didn't expect him to stay more than a year or two. He was considered an eccentric, because he often made surprising comments about a myriad of topics, trivial to momentous. But how could it be otherwise. To have accomplished so much with such originality and so contrary to the generally accepted (frequentist) dominant paradigm required a unique as well as powerful mind. A Bayesian to the core, he was always willing to lay odds on his propositions, and bet with any doubters. Those who (e.g., I) took these bets usually (always) lost, and soon learned better, so he didn't get much action.

His door was always open. Dropping in often led to the posing of a mathematical or linguistic riddle. When the meaning of a word was in doubt, he reached for at least two, usually three dictionaries, for resolution. Despite being almost always right, he was patient and cordial with all doubters. He was engaged in the Bayes-frequentist argument as early as the 1950s with the likes of Dennis Lindsey, then a frequentist, yet he patiently continued the argument through the 1980s, 90s, and beyond with relatively uninformed acolytes (like me).

There was, at last, one occasion when he was wrong and I was right. He presented a two-minute geometry theorem and proof, which I immediately recognized as in error. As I mentioned, this was a first, and it was so shocking that I insisted he see a doctor. It turned out that his thyroid was failing, a common ailment of the elderly. It was easily remedied by a small daily dose of thyroxin, but that marked the beginning of a gradual decline.

Toward the end of his career, Jack began to dabble in physics, publishing papers on the probability of certain integer physical constants, and other papers defending Einstein's theory of relativity against apparent cranks. I told him that a physicist friend told me that physicists were laughing at him. Jack immediately replied that he liked it when people laughed at him [as they often did], because that meant that he had a good idea [no pun intended]. Jack put it this way: "A crank is a genius who happens to be wrong. A genius is a crank who happens to be right."

Finally, Jack had a great sense of humor, and was almost always in good humor. Good humor consisted of jokes, puns, and limericks, many of which he composed himself. While he longed for greater recognition, often pointing out work of his which had been credited to others (e.g., his nearly unknown [1958 JRSS paper](#) on the Discrete Fourier transform anticipated the universally cited [Cooley and Tukey \(1965\)](#)), he was never bitter about it, and it never occurred to him to engage in any form of self-promotion. As Jack's friend and former dean Henry Bauer put it, Jack was a genuinely nice person.



My prediction is that as the 21st century Bayesian wave sweeps across statistical science, its foundation in the works of I. J. Good will be revealed and appreciated. David Banks and Eric Smith have recently put out *The Good Book: Thirty Years of Comments, Conjectures and Conclusions by I.J. Good*,

Rice University Press (<http://ricepress.rice.edu>). They are also working on electronic republication of *Probability and the Weighing of Evidence* (1950) and *Good Thinking: The Foundations of Probability and Its Applications* (1983). See *Jack: The Good Zoroastrian*, by Nozer D. Singpurwalla at <http://cnx.org/content/m17448/latest/>. In addition, we are making available two video interviews of Jack that were produced by J.A.N Lee and Golde I. Holtzman in 1992: (i) *I.J. Good and Donald Michie in Conversation with David Kahn and Karen Frenkel*. Part 1: From Codebreaking to Computing, Remembrances of Bletchley Park Fifty Year Later. Part 2: From Wartime to Peacetime, The Years of Development of Computing and Artificial Intelligence. and (ii) *Good Talking: I.J. Good in Conversation with Persi Diaconis*. – contributed by Golde Holtzman



With David Banks and Eric



With emeritus faculty

Jack celebrating his 92nd birthday





UNDERGRADUATE PROGRAM

Spring 2009 Graduation

Undergraduate Degrees

In December 2008, **Sean Pieroni** and **Choupel Lhundup** received their undergraduate degree.

In May 2009, we had eleven graduates who completed their degree during the Spring 2009 or Summer 2009 semesters. They included **Daniel Cagle, Matthew Campbell, Paula Colgin, Collin Fox, Richard Fraenkel, Michael Jabs, Sean Kanipe, Matthew Malkus, Lucy Robeson, Donald Stewart, Madeleine Teller, Garrett Zawoysky, and Allison Zotti**

Two members of the 2009 graduating class passed their first actuarial exam this spring. Congratulations to Michael Jabs and Lucy Robeson.

Actuarial Science - Minor

The Actuarial Science minor was approved by the University administration in June 2008.

Undergraduate students graduating in May 2010 or later could begin declaring the minor this fall. There are currently 22 students in the program.

Undergraduate Award Winners for 2008-2009

The Whitfield Cobb Award -

Awarded to the graduating senior with the highest academic performance overall

Michael Jabbs

The Clyde Y. Kramer Award -

Awarded to a graduating senior who has shown outstanding service to the University and the broader community

Lucy Robeson



GRADUATE PROGRAM

We began the 2008-09 year with 63 students, 38 MS students and 25 PhD students, with 20 new students entering the program.

Graduate Degrees

The Fall 2008 Master of Science graduates were **Jonathan Celso** (now a PhD student at the University of Tennessee), **Xiaobo Guo**, **Keminda Herath** (now a statistician in Sri Lanka), **Patrick McCann** (now with Comscore), **Elaine Nsoesie** (now a PhD student in GBCB program at VT), **James Ringer** (now a statistician with Minitab), **Charles Sabatia** (a PhD student in forest biometry at VT), **Xiangrong Wang** (now a PhD student in Education at VT), **Qi Zhang** (now a Senior Compensation Analyst at Advance Auto), **Wen Zhang**. Additionally, **Nels Johnson**, **Jennifer Kensler**, **Matthew Williams**, and **Pei Xiao** are continuing as PhD students in the department.

In Spring, 2009, Master of Science degrees were awarded to **Yi Chao**, **Megan Lutz** (now a PhD student in Research and Development at Georgia Tech), **David Peng** (now a statistician in the DC area), **Mari Rossman** (now a statistician for Chiacchierini & Associates). **Khaled Bedair** and **Marwah Soliman** are continuing in the department as PhD students.

PHD Degrees

In Fall 2008 and Spring 2009 the PhD graduates were **Jianying Lou**, **Xiaowei Wang** (now at GSK), and **Sara Rue Wilson**. Details of their PhD dissertations are:

Jianying Lou (2008) Title: Diagnostics After a Signal From Control Chart in Normal Process.
Advisor: Marion Reynolds

Xiaowei Wang (2009) Title: Weighted Optimality of Block Designs. Advisor: J.P. Morgan

Sara Rue Wilson (2009) Title: Control Charts with Missing Observations. Advisor: Marion Reynolds

Graduate Award Winners for 2007-2008

- Boyd Harshbarger Award -

Awarded for outstanding academic achievement by a first year graduate student

Liaosa Xu and Lulu Cheng

- Jesse C. Arnold Award -

Awarded for outstanding teaching by a graduate teaching assistant

Abdel-Salam G. Abdel-Salam

- Klaus Hinkleman Award-

Awarded for outstanding service by a graduate student to the department or university

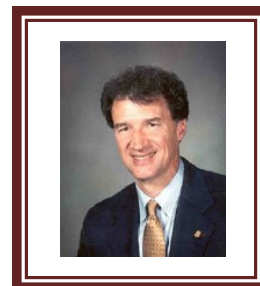
Matthew Williams



DEPARTMENT ACTIVITIES

Mentoring Program

The Teacher Mentoring Program completed another successful year preparing graduate students to take on the responsibility of teaching. Under the direction of two Ph.D. students, **Jonathan Duggins** and **Laura Freeman**, and the advising of **Dr. Jeffrey Birch**, the program provides graduate students with resources and advice on many instruction related topics such as dispute resolution and creating a classroom dynamic that engages students. The teachers in the department get together several times a semester to review Virginia Tech teaching policies, swap stories and discuss various teaching techniques. This past semester the mentoring program proved to be more useful than ever before because graduate students taught 16 courses in statistics! We think this might be a record for the department!



The drastic increase in the number of students teaching made the need for a written teacher handbook, detailing techniques and policies for teaching, became apparent this year. The mentoring program has answered that call and the handbook will be made to all student teachers starting this fall. Plans to ensure the on-line availability of the handbook as well as other resources are currently underway and are scheduled to be completed by the upcoming spring semester.

After two wonderful years working with the Teacher Mentoring Program, Jonathan and Laura are passing their collective torch. **Anne Ryan**, another Ph.D. student, will begin her tenure as coordinator for the mentoring program in the fall. We look forward to her contributions and we know she will continue to help her peers learn and grow as teachers.



Student Internships

Several of our graduate students participated in internships this past year. Internships may be in government, industry or with another university department and are taken for course credit. Each participant must present an oral presentation to the department and a written report to their department and on-location advisors summarizing their experience. A summary of the interns is below



- **Casey Turner.** Summer 2009. Company: NASA. Casey is developing a hybrid apparatus calibration experimental design for force balances used in wind tunnel testing at NASA Langley Research Center. The main goal of the design is to reduce cost/labor hours and time for a complete force balance calibration (also to implement formal design techniques versus the current one factor at a time techniques being used in calibration).
- **Huaiye Zhang.** Summer 2009. Company: M.C. Dean Inc. M.C. Dean Inc. is an engineering and integration firm specializing in complex electrical, electronic, and telecommunication systems. Their human resources department is looking for possible correlation between employee's performances and variables of interest. Huaiye's position is related to data mining, statistical analysis and data management.
- **Lucas Roberts.** Summer 2009. Company: Capital One. Lucas is working in the Credit Risk Management Department working on statistical applications to Consumer Banking Profitability. Lucas' main focus was forecasting future customer deposit balances and account usage based on past performance data. These models will be utilized to drive customer marketing strategies as well as enable a deeper understanding of Capital One's customer base. The main statistical areas applied were data dimensionality reduction, nonparametric smoothing, and generalized linear model theory.
- **Veronica Bubb.** Summer 2009. Company: Merck Research Laboratories. Veronica Bubb is working with Merck Research Labs to investigate the properties of Statistical Process Control (SPC) methods adapted for the purpose of monitoring vaccine efficacy in a post-marketing surveillance study. This work is being done through collaboration with Dr. Bill Woodall at Virginia Tech in addition to David Radley and Brooke Marshall at Merck. In the application being considered, using control charts presents unique challenges because the disease registry data used for monitoring is very different than data traditionally used in SPC methods. Veronica has helped to develop a modified Shewhart control chart for this application and is currently working on programming this methodology so that its performance can be evaluated under different scenarios through simulation. Once this evaluation is complete, appropriate control chart settings will be chosen and the method will be used to monitor the efficacy of a newly licensed vaccine.

HONORS

- **Denisa Olteanu** has been awarded the Mary G. and Joseph Natrella Scholarship from the Quality and Productivity Section of the American Statistical Association. In addition to a cash award, Denisa will be given the opportunity to present some of her dissertation research at the 2009 Quality and Productivity Research Conference (QPRC) in June, all expenses paid. **Abdel-Salam G. Abdel- Salam** won this award last year.



- **Laura Freeman** has been awarded the **Amelia Earhart Fellowship** for the 2009-2010 academic year. The Amelia Earhart Fellowship was created in honor of Amelia Earhart to provide financial assistance to women pursuing graduate degrees in aerospace related sciences and engineering. The highly competitive award provides \$10,000 to thirty-five annual recipients from around the world. Laura was awarded the fellowship in 2008-2009 as well. In addition Laura has also been awarded the **Graduate Woman of the Year**.



This award recognizes:

- Involvement in professional organizations, campus activities and the graduate community
 - Contributions to the graduate community at Virginia Tech
 - Commitment to diversity
 - Contributions to new knowledge through teaching, research and scholarship
- **Abdel-Salam G. Abdel- Salam** was awarded the 2009 Richard A. Freund International Scholarship by the American Society of Quality. **Denisa Olteanu** won this award last year. He also won the Jesse C. Arnold award for teaching by a TA for last year.



Please join us in congratulating Denisa, Laura, and Abdo for receiving these honors.

The department has published numerous papers and books. A complete list of 2008-2009 research papers, grants, and presentations please see the web page.



S. Wilson with Eric Smith, Bill Woodall and Willie

Photos from the
2008 Corporate
Partners reception.



Dick Krutchkoff with Jean Gibbons

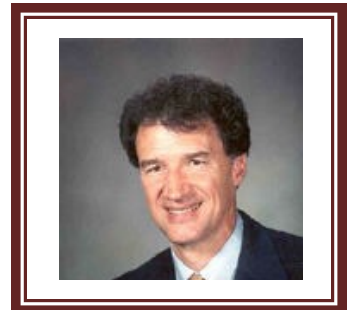


Faculty Research

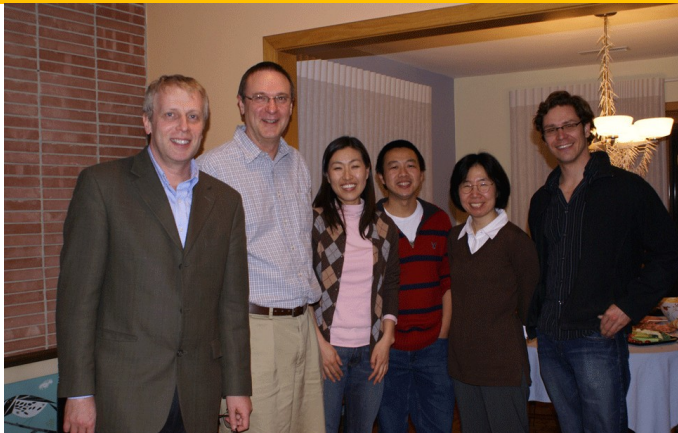
- **Dr. Pang Du's** research focuses on nonparametric estimation, variable selection methods, and functional data analysis. Nonparametric estimation recovers the true underlying "pattern" function without imposing strong assumptions as in parametric methods on the form/shape of the function; Dr. Du's specialties in this area are splines, kernel methods, and wavelet methods, applications include survival/reliability studies, analysis of various spectra, image reconstruction, and seismic data. Variable selection methods considered by Dr. Du select important variables/features through proper specification of penalties like LASSO and SCAD, applications include gene identification in bioinformatics and feature selection in data mining. Functional data analysis concerns the studies where the units of observation are curves/surfaces and the observed data consist of sets of curves/surfaces that are sampled on a fine grid, applications include profile classification in bioinformatics, engineering, climate research, transportation, etc.



- **Dr. Jeffrey B. Birch.** Dr. Birch's research focuses on the development and application of regression theory and methodology. He is particularly interested in the behavior of existing methods under less than ideal conditions and the development of methods that are robust to a broader variety of conditions. He currently is working on the application of his work to the quality control area and, specifically, with the newer topic of profile monitoring. Some of his recent papers, with Willis Jensen, on modeling linear and nonlinear profiles with correlated observations can be seen in the *Journal of Quality Technology*. Dr. Birch's current PhD student is Abdel-Salam Abdel-Salam. "Abdo's" research focuses on the



Ilya Lipkovich (Eli Lilly and Compay) with faculty. Dr Lipkovich taught a short course on Pharmaceutical Statistics



profile monitoring of nonlinear profiles via Model Robust Regression (MRR), a semiparametric method developed by Dr. Birch and several of his previous PhD students. MRR is used in those situations where the profiles cannot be represented well by parametric models.



Giving to the Department

Dr. Smith writes:

As I look back over the accomplishments of the last year, I am impressed by the hard work of our faculty, students and staff. I am also especially grateful for the support of our alumni and friends. Our Corporate Partners program has helped with our recruiting of new graduate students through financial support and internships. We are also especially grateful for the MINITAB fellowship that we award each year.

This year we were blessed to have a new award added to the suite of awards that we give to graduate students: the Raymond H. Myers Fellowship Award. Ray was an essential element of our department for years and excelled in both research and teaching. His award is given to the top student in Linear Models and Experimental Design. The first award will be given at the Corporate Partners Meeting in October. This fellowship compliments the Jean Dickinson Gibbons Statistics Award. Jean Gibbons graduated from our department in 1962 with a Ph.D. and went on to an illustrious career as a researcher, teacher and administrator. Her book Nonparametric Statistical Inference is a classic text on the subject and continues to be a popular text. The Gibbons award will be used to help a new Ph.D. student with research expenses.

We would love to have more support for our students and faculty. Contributing to the department is relatively easy. You may send a contribution to

**University Development
Virginia Tech
902 Prices Fork Rd. (0336)
Blacksburg, VA 24061**

Be sure to let them know that you want the money to go to the Department of Statistics.

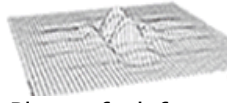
There are a variety of funds that you might consider besides the General fund for the department including awards for **graduate students**:

Boyd Harshbarger Award
Jesse C. Arnold Award
Klaus Hinkelmann Award
Ray Myers Award

And for **undergraduates** we have:

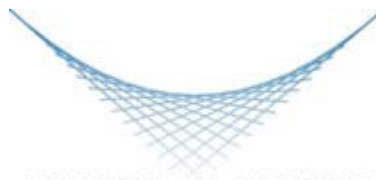
Clyde Kramer Scholarship





Department of
Statistics

Please feel free to call me if you wish to discuss contributing to the department. We really do appreciate your support!



COLLEGE OF SCIENCE