

Mathematics & Statistics Newsletter

Old Dominion University

Chair's Message:

Dr. Hideaki Kaneko

Hello Faculty, Students and Alumni,

We are off to a great start for AY 17-18. A new program: BS in Mathematics – Big Data Analytics Major was approved last year. A set of new courses bearing the prefix BDA were created. Titles of these courses are Introduction to Machine Learning, Data Mining, Optimization and Inverse Problems, Senior Projects in Big Data Analytics and Modern Statistical Methods for Big Data Analytics. A course in Machine Learning is scheduled to be launched in the spring of 2018. We anticipate Data Mining course to follow in the fall of 2018. It is an exciting time for the department as it is poised to assume a major role in advancing the university's initiative in Data Science.

During AY 17-18, the department will be conducting a search to find two Assistant Professors in the area of Data Science.



I am happy to announce that Professor Yuesheng Xu of Sun Yat-Sen University has joined the department as Professor of Mathematics. Before his appointment with Sun Yat-Sen University, Yuesheng served as Professor of Mathematics at Syracuse University for 11 years. Yuesheng received his PhD in Computational and Applied Mathematics from our department in 1989. Since then, Professor Xu has built an illustrious career in applied mathematics and his reputation as a leading voice for multiscale analysis is recognized worldwide. A recent book published in 2015 by Cambridge University Press, entitled *Multiscale Scale Methods for the Fredholm Integral Equations*, is culmination of his work in this area.

Recently, Yuesheng has been working in the area of Data Science. He works with researchers at the Memorial Sloan Kettering Cancer Center in NY to study medical imaging problems. He also published extensively in the *Journal of Machine Learning*, a leading journal which publishes mathematical analysis in Machine Learning. He serves on editorial boards of eight professional journals. In the past, he has secured a number of grants from funding agencies such as NSF, NASA, AFOSR and DOE. Dr. Xu has also supervised PhD thesis of more than 40 students.

Please join me in welcoming back Yuesheng to our department!



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Special points of interest

- SIAM Conference
- COS Awards
- Graduate Program
- New Faculty
- Sue Doviak Luncheon

Featured Faculty Member:



Fang Hu: Dr. Hu received his PhD in Mathematics from Florida State University in 1990 and joined the department that year. He was promoted to Associate Professor in 1996 and to Professor in 2002. During his tenure, Dr. Hu published more than 30 articles in top journals, including Journal of Computational Physics, Journal of Sounds and Vibration and Computers and Fluids. Fang has been closely involved in research at NASA Langley. Recently, he is working on a NASA funded project "Fast and efficient computation of acoustic scattering and its application to aircraft noise prediction". Since joining our department in 1990, Fang has secured a number of grants totaling more than \$1 million. He has been also very active in student supervision. Six students completed their PhD thesis under his guidance and he is currently

directing another student Ms. Michelle Pizzo on jet noise abatement research project. His research is regarded highly through the world. He was an invited speaker of approximately forty conferences. During the last three years, he has served as Associate Chair for Research as well as the Director of the Richard F. Barry Colloquium.

Thanks, Fang, for all you do!

For every equation, no matter what the context, tells a story. We just have to learn to read it (even if it takes a lifetime of learning).....John Adam

Course Coordinators:

Math 101– Shari Davis
Math 102– Eunice Pepper
Math 103M– R. Flanagan
Math 162–R. Strozak
Math 163– R. Stowe
Math 200–T. Grant
Math 211/212/312– P. Bogacki & Gordon Melrose
Stat 130M– J. Russell

College of Science Awards:

Awards: The following members of the department received COS teaching awards or recognition for dedicated service to the university. Congratulations to all!

Dr. John J. Tweed- COS Distinguished Research Award

Dr. John Adam—COS Distinguished Teaching Award (Tenured/Tenure Track Faculty)

Dr. Raymond Cheng— COS Distinguished Teaching Award (Lecturers/Faculty of Practice)

Mr. Mario Scribner—COS Distinguished Teaching Award (Adjuncts)

Promotions:

Shari Davis—was promoted to Master Lecturer

Graduate Program:

Mark Ledbetter was awarded the Phil Wohl Scholarship by the department.

Johnathon Upperman won both a scholarship from the Virginia Space Grant Consortium (VSGC), and a SMART scholarship (Science, Mathematics and Research for Transformation).

In the last year, we produced 1 Ph.D. and 8 M.S. graduates.

Monica Arora presented at Eastern North American Region (ENAR) 2017 conference on 'Poisson Regression Models for Zero and K Inflated Count Data'. The conference was organized by ENAR International Biometric Society along with IMS and ASA from March 12-15, 2017 in Washington D.C.

Sue Doviak Retirement Luncheon



Katie Smith:

Katie Smith gave a talk at the American Society of Engineering Education (ASEE) Global Colloquium Which was held on Terceira Island, Azores, Portugal during September 16-18, 2017.

The 2017 ASEE Global Colloquium was the first Global Colloquium held since 2011. The Colloquium was co-located with the 2017 European Society for Engineering Education (SEFI) Annual Conference to promote collaboration between the United States and Europe in order work to improve engineering education. The conferences were held on Terceira Island in the Azores which is about 850 miles from Europe and 1,200 miles from North America as a symbolic gesture to exemplify the importance of forging new collaborative partnerships between the two continents.

Ms. Smith presented a paper entitled “Overview of Game and Content Design for a Mobile Game that will Prepare Students in Calculus and Physics Prerequisites to the Engineering Curriculum”. The paper focused on the range of educational games for STEM education that is under development as part of the Stern2STEM project which assists veterans as they exit the military, complete engineering degrees, and enter the workforce as engineering professionals. CAPTIVATE is an educational game designed to assist student veterans in mastering the calculus and physics skills that are necessary prerequisites to the main engineering curriculum. Building on the lessons learned from MAVEN, a game to help student veterans master precalculus skills, the design and development of CAPTIVATE involved careful consideration regarding game and instructional design. Many of the positive aspects from the design of MAVEN have been implemented in CAPTIVATE including reimplementing of the overall framework developed for MAVEN. Additionally, by embedding concepts in game play from well-known board games such as Battleship, computer games such as Minesweeper, and console or mobile games such as Guitar Hero, students use their calculus and physics skills to complete tasks in a familiar environment. While MAVEN was developed for desktop deployment, CAPTIVATE is deployed on a variety of mobile devices so that students will be able to engage with the material at a time and place convenient for them. While the current project is specifically aimed to help military veterans as they work to earn engineering degrees, all games developed through this project are available for download free of charge to the public.

Following short freeform presentations, crowd-sourcing was utilized to identify topics for further discussion. One of the topics with the most interest was Games for Learning and Ms. Smith lead an hour-long discussion on the topic focusing on perception, challenges and future directions in games for learning. As a follow-up to the discussion, she will submit a summary report to the conference organizers to be included in an overall Colloquium report to be presented at the ASEE Annual Conference in Salt Lake City, Utah in June 2018.

Paper Citation: Smith K., Shull J., P. Heaney, Shen Y., Dean A., Michaeli J. “Overview of Game and Content Design for a Mobile Game that will Prepare Students in Calculus and Physics Prerequisites to the Engineering Curriculum.” 2017 ASEE Global Colloquium. Terceira Island, Azores, Portugal, September 16-18, 2017.

Outstanding Students:

Mark Ledbetter– Philip R. Wohl Scholarship

Sam Gedon: Best Student:
BS in Mathematics Applied
Mathematics option.

Haoting Wen: Best Student:
BS in Mathematics: Actuarial
Math/Stat option.

Devan Dunbar Best Student
BS in Mathematics: Secondary
School Teachers Option.

Math & Stat Club Officers:

President:
Charles Armstrong

Vice-President:
Prasansha Liyanaarachchi

Treasurer:
Dilini Gamage

Secretary:
Vacant

SIAM Student Chapter Officers

President:
Katelin Ashley

Vice-President:
Lacey Schenk

Secretary:
Zachary Duff

Advisor:
Raymond Cheng

SIAM in Pittsburg PA.

The Society for Applied and Industrial Mathematics (SIAM) held their Annual Meeting during the week of July 10 – 14, 2017 in Pittsburgh, PA. Three graduate students (Michelle Pizzo, Anthony Williams, and Katelin Ashley) and one professor (Dr. John Kroll) from the Department of Mathematics and Statistics attended this conference. Michelle is a Ph.D. candidate studying under the advisement of Dr. Fang Hu and served as the ODU SIAM Student Chapter President (AY15-16) and Treasurer (AY16-17). Anthony is a Ph.D. candidate studying under the advisement of Dr. Ruhai Zhou and served as the ODU Math/Stat Club President (AY15-16) and Treasurer (AY16-17).

Katelin is a second year graduate student, served as the ODU SIAM Student Chapter Vice President (AY16-17), and represented the department as the SIAM Annual Meeting Student Days Representative.

Dr. Kroll is an Associate Professor and focuses his research on climate modeling. At the conference, Michelle presented a paper entitled “High Performance Computing for Sensor Data Fusion and Closed Loop Control in 3D Printing” (co-authors: Travis Taylor, University of Alabama, USA; Wade Hunter, Old Dominion University, USA; Godfrey Sauti and Dana Hammond, NASA Langley Research Center, USA) and Anthony presented a paper entitled “Instability and Patterns of Active Suspensions of Liquid Crystals” (co-author: Ruhai Zhou, Old Dominion University, USA). Additionally, Dr. Kroll presented a paper entitled “Fire, Ice, Water and Dirt: A Simple Climate Model. An Adventure in Mathematical Modeling”.

Michelle, Anthony, and Katelin enjoyed the conference for both its professional and educational benefits. As graduate students, attending conferences such as the SIAM Annual Meeting is invaluable to our academic experience. We are grateful to the ODU Department of Mathematics and Statistics, SIAM Student Chapter, and Math/Stat Club as well as the SIAM organizers for funding our travel without which our attendance would not have been possible. Below are some excerpts from our personal experience during the week.

Michelle ———

This was my second year attending and presenting at the SIAM Annual Meeting. Just as last year, this was a very rewarding experience for me to not only enhance my presentation skills but also to network with key students and professionals in the field of applied mathematics. The research that was presented was a culmination of work accomplished by two student interns at NASA Langley Research Center (LaRC) whom I, along with two colleagues, mentored between the months of September 2016 and December 2016. The research involved using high performance computing (HPC) for in situ characterization in 3D printing to enable real-time closed loop control. Overall, attending this year’s conference was a great experience both personally and professionally to bring light to the current HPC efforts my colleagues and I are involved in at NASA LaRC.

Anthony ———

Going to the SIAM Annual Meeting in Pittsburgh this year was very rewarding. The city itself is very beautiful (and its multitude of bridges), and there were many things to do and see while we were there. Similar to last year’s meeting in Boston, it was a very interesting experience being able to network with people from so many different countries and affiliations. Specifically for me, it was a great experience being able to present this year since it was my first time presenting my research at a large conference. After my presentation, I was able to gain some insights on my work and other’s work that is similar to mine. Also, it was nice to see Dr. Kroll present his research at this conference to a good-sized crowd. I can’t wait to attend next year when the conference is in Portland!

SIAM in Pittsburg PA. Continued:

Katelin ———

The SIAM 2017 Annual Meeting was the first conference I have attended as a graduate student at ODU, and it did not disappoint. I was able to attend my fellow graduate students and Dr. Kroll' talk in support of them.

I also attended the Student Day's Breakfast, where I was able to collaborate with SIAM leaders and students from other universities. This gave me an opportunity to see how others have expanded their clubs and got more students involved.

The highlight of the trip was getting to listen to Dr. Christine Darden talk of the challenges she faced throughout her career and highlight the role that mathematics played during her time with NASA. During the week of the conference, we also found some time to get out and explore Pittsburgh, PA!



It is the mark of a truly intelligent person to be moved by statistics.....George Bernard Shaw

Featured Faculty Member:



Shari Davis: Shari received her MS in Mathematics from Queen's College in 2001 and joined the department that year as Lecturer. She was promoted to Senior Lecturer in 2010 and to Master Lecturer in 2017.

Throughout her tenure Shari taught various undergraduate Mathematics courses including: Pre- Calculus, Statistics, College Algebra, Applications of Mathematics and Mathematics for Critical Thinking. She also assisted in developing the curriculum and syllabus for

the Applications of Mathematics course, now known as Math 101: An Introduction to Mathematics for Critical Thinking.

She was a course coordinator for Pre-Calculus course and now serving in that capacity for Math 101. Shari received the College of Sciences Distinguished Teaching award in 2014.

Shari is also a recipient of President John R. Broderick Diversity Champion Award in 2016. She is recognized as recipient of "Shining Star Award" in 2008, 2009, 2010, 2011, 2012, 2013, 2014 and 2015.

Finally, Shari received the Faculty Innovator Grant, entitled "Supplemental Critical Thinking Explorations to Promote Discovery and Deeper Comprehension", in 2016.

Way to go Shari!





Richard F. Barry Seminars

Fall 2017

Sept. 14: Xi Chen, Princeton University

Oct. 12: Holly Gaff, Old Dominion U.

Oct. 26: George Hsieh, Norfolk State

Nov. 2: Krishnanand Kaipa Old Dominion

Nov. 16: Xiaoming Hu, Georgia Tech

Dec. 7: Haibo Dong, University of VA.

News:

A Student Chapter of Association for Women in Mathematics (AWM) was established. Drs. Sookyung Joo, Kayoung Park, Yan Peng and Lucia Tabacu serve as faculty advisors of the chapter. They are planning to invite speakers and hold regular meetings in the future.

A long time faculty member, Ms. Sue Doviak, retired in May 2017. Sue joined the department in 1988 and was very active throughout her career in improving the quality of mathematical education. We held a retirement party for Sue in August. It was attended by many faculty members, including President Broderick and Dean Dodge, and students. A large attendance was a testament to Sue's wonderful contribution to the university.

Carl A. Schulz Memorial Scholarship was established by the Schulz family in memory of Professor Carl Schulz who passed away in the spring of 2017. The scholarship will award top undergraduate students in mathematics or statistics in the future.

Other News:

Dr. Rao Chaganty gave a plenary Invited talk entitled "New methods for longitudinal analysis of health and clinical data" at the International Workshop on Clinical Data Analytics, Hyderabad, India in December 2016.

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- Faculty Advisor of Student Chapter of SIAM: Raymond Cheng
- Statistics Program Director: Rao Chaganty
- CDA: D. Glenn Lasseigne
- Assistant Chair of Instruction/Scheduling: Gordon Melrose
- RFB Colloquium: Fang Hu & Yan Peng
- Associate Chair of Research: Fang Hu
- Faculty Advisor of Student Chapter of Association for Women in Mathematics (AWM): Sookyung Joo
- Newsletter: Hideaki Kaneko
- Coordinator of ONLINE instruction: P. Bogacki
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