Chair’s Message
Dr. Hideaki Kaneko

I am happy to report to you that the department continues to thrive in the areas of research and teaching. The new BS program in Big Data Analytics (BDA) is in its second year of existence and it is gaining popularity among our students. A new ONLINE Graduate Certificate Program for Computational Data Analytics is being proposed; this entails online development of four BDA courses: Introduction to Machine Learning I & II, Optimization and Inverse Problems and Statistical Methods for Big Data Analytics. We anticipate launching this new certificate program in the academic year 2020-2021.

Several faculty members are involved in special projects aimed at improving student academic performance in College Algebra and Precalculus. Data from Fall 2018 indicate that students who are participating in the Precalculus pilot projects are performing much better academically. We are very encouraged by these results and anxious to receive the results from spring 2019.

Bob Strozak, Master Lecturer, received the COS Distinguished Teaching Award in April 2019. Undergraduate students, Angela Branch is the recipient of the Carl A. Schulz Jr Scholarship, Justin Williams received the Elzie Glenn Whitlock Endowment Scholarship and Daniel Weddle received the Wayne A Helm Scholarship. This year’s Philip R. Wohl Memorial Scholarship was awarded to Mohammed Alqawba who expects to complete his PhD degree in August 2019. Top Undergraduate Students are listed on Page 3 of this newsletter. Congratulations to all!

The 2nd Annual Julia Robinson Mathematics Festival (JRMF) attracted approximately 165 students from the Tidewater region. This has been a great outreach program and I thank Katie Smith and Blair Swoope for spearheading this effort! More information on the JRMF can be found on page 2.
The Second Annual Julia Robinson Mathematics Festival: The Old Dominion University Mathematics & Statistics Department hosted the Second Annual JRMF ODU Mathematics and Computer Science Festival on Saturday, March 2, 2019. The event was also supported by the Computer Science Department and several members of the community. The event was coordinated by organizer Katie Smith and co-organizer Blair Swoope, both faculty in the Department of Mathematics & Statistics. The event was also supported by a team of nearly 50 incredible volunteers including faculty and students. The festival attracted approximately 165 students in 4th through 8th grades from the Hampton Roads area. The theme of the festival was “What’s Your X?” encouraging students to relate to problem solving activities. To promote excitement and enthusiasm for STEM, the organizer created a diverse cast of X characters. The event was a success as students enjoyed problem and puzzle solving activities including Measuring Rice, The Last Chip, Tiling Torment, Candy Conundrum, Switching Light Bulbs, Computer Science, Tower of Rings, and ConHex. Each participant received a t-shirt with the characters, string backpack, snacks, and a character button. Organizers received overwhelmingly positive feedback from parents, chaperones, and participants with over 93% of respondents rating the festival positively. We are looking forward to coordinating the Third Annual JRMF ODU Mathematics and Computer Science Festival in Spring 2020.

Julia Robinson Mathematics Festival — Coming — February 29, 2020!

Featured Faculty

Dr. Andrea Jones - Senior Lecturer
Andrea received her BS degree in Chemical Engineering from Virginia Tech in 1996 and MS (2006) and PhD (2007) in Computational and Applied Mathematics from Old Dominion University. Since joining the department in 2007 as an adjunct faculty, she taught a variety of math courses, including Calculus III, Ordinary Differential Equations, Linear Algebra and Calculus for Business and Economics. She received the Shining Star Award in 2005 in recognition of her demonstrated evidence of helping student succeed academically, professionally, or personally inside and outside of the classroom setting. She is currently revamping Math 200 curriculum so that the course focuses more on the applications of calculus to business related problems.
Outstanding Students:

Mohammed Alqawba—The Philip R. Wohl Scholarship.

James Kelvington: Top Undergraduate Senior Student in Statistics.

Isabel Ballesteros: Top Undergrad Senior Student in Mathematics for Secondary School Teachers.

Nicole Brailer: Top Undergraduate Senior in Applied Mathematics Major.

Elizabeth Trahadias: Top Undergraduate Senior in Actuarial Mathematics Major.

Dr. Kroll obtained his PhD in Applied Mathematics from Yale University in 1973. After spending two years at Nova Oceanographic Laboratory and one year at MIT, he joined the Department of Mathematics and Statistics of Old Dominion University in 1976 as an Assistant Professor of Mathematics. Dr. Kroll currently holds the rank of Associate Professor. During the period of 43 years at Old Dominion University, John conducted research in the field of Oceanography. He spent one year 1985-86 at the Naval Postgraduate School as National Research Council Senior Associateship. From 1991 to 2000, Dr. Kroll also served as a Principal Investigator at the Center for Coastal Physical Oceanography at Old Dominion University. He has published 20 research articles in various professional journals and secured two grants from the National Science Foundation.

Dr. Kroll taught several different math courses at undergraduate as well as at graduate level, including Vector Calculus, Mathematical Modeling, Complex variables, Biomathematics, Partial Differential Equations and Perturbation Methods. Moreover, Dr. Kroll served as the Chief Departmental Advisor from 2003 to 2013.

Dr. John Kroll retirement date is May 24, 2019.
Featured Faculty

Dr. Yan Peng - Associate Professor
Yan received her PhD in Computational Fluid Dynamics from the National University of Singapore in 2005. She joined the department in 2006 as Research Assistant Professor of Mathematics. She took the position of Assistant Professor in 2008 and subsequently promoted to the current rank of Associate Professor in 2014. Yan published more than 40 articles in various professional journals and proceedings. She has secured 4 external funding including a grant from the National Science Foundation entitled, “Numerical study of electrokinetic bioparticle transport through fluid-structure-electric interaction”. She is a recipient of the Shining Star Award in 2010 and also the College of Science Early Career Research Award in 2013. Two PhD students completed their thesis under Yan’s supervision and currently three additional PhD students are writing theses in the area of CFD.

New Faculty

Dr. Guohui Song – Associate Professor of Data Science: Dr. Song received his BS degree in Mathematics and Applied Mathematics from Wuhan University, Wuhan, China in 2003 and PhD in Mathematics from Syracuse University in 2009. He held a post-doc position at Illinois Institute of Technology and at Arizona State University before joining Clarkson University in 2012. We are delighted that he made decision to join us in Fall 2019. Dr. Song’s research interests are Machine Learning, Optimization, Image/Signal Processing and Applied Computational Harmonic Analysis. Probability, Statistics and Linear Algebra are his favorite undergraduate courses to teach. At the graduate level, he enjoys teaching Statistical Learning/Data Mining, Optimization and Real/Complex/Functional/Convex/Numerical Analysis courses. Dr. Song is currently completing his NSF funded projects, An Integrated Approach to Convex Optimization Algorithms. He will begin another NSF funded project starting Fall 2019.

Dr. Sinjini Sikdar – Assistant Professor of Data Science in Computational Statistics: Dr. Sikdar received her BS degree and MS degree in Statistics from University of Calcutta in 2010 and 2012 respectively and PhD in Biostatistics from University of Florida in 2017. During the last two years, she is conducting research under Post-doc Fellowship in the Epidemiology Branch of the National Institute of Environmental Health Sciences located in the Research Triangle, NC. Her research interested are Bioinformatics, Genetic Epidemiology, Genome-wide Association Studies, Environmental Epigenetics, Statistical Genomics and Statistical Proteomics. Dr. Sikdar has authored 8 research articles in various professional journals.

Dr. Sandipan Dutta – Assistant Professor of Statistics: Dr. Dutta received his BS degree in Statistics from University of Calcutta in 2010, MS degree in Statistics from Indian Institute of Technology Kanpur in 2012 and PhD in Biostatistics from University of Louisville in 2016. He has been serving as Post-doc Associate in the Department of Biostatistics and Bioinformatics at Duke University. His research interests are Rank based inference for clustered data, Survival analysis and multistate models regression, High dimensional regression of censored data, Resampling and Subsampling techniques, Prognostics and predictive modeling of clinical cancer data, Sample size and power calculation in clinical trials. He has authored 9 articles in various professional journals.

What is a Math Teacher’s favorite type of tree? A: a “Geome-tree”
SIAM Math Awareness Conference

Annual SIAM Math Awareness Conference was held on April 6th, 2019. The conference was attended by more than 55 participants. There was the total of 14 speakers, including three invited speakers. The invited speakers were:

Dr. Tyrus Berry [GMU], The Mathematics of Manifold Learning

Abstract: This talk will introduce manifold learning as an important paradigm arising in data science and machine learning. We will start by explaining the fundamental assumption, which is that our data lies on a manifold (a nonlinear low dimension subspace of the data space). We also examine the situations where such an assumption may naturally arise. We then turn to the algorithms that have been developed to represent the nonlinear structure of the manifold and I introduce the mathematics that underlies them. Finally we discuss how these questions fit into the wider context of data analysis and mathematical modeling and examine some future directions and open questions.

Dr. Alexandra L. Hanlon [VT], Data Analytics in Nursing: A Case Study

Abstract: The main purpose of the present study is to provide an example of collaborative work to students interested in pursuing careers in applied biostatistics and/or the health data sciences. We will use and compare three data mining techniques, namely, logistic regression (LR), decision tree modeling (DT), and random forests (RF), to identify clinical phenotypes that may predict the risk of depression among young adults not on antidepressants and to predict antidepressant treatment response among those receiving antidepressant treatment. Wave IV data from over 3,000 young adults aged 24 to 32 years participating in the National Longitudinal Study of Adolescent to Adult Health (Add Health) will be used. Potential predictors considered in these analyses include demographics (education, race, birth country), health-related variables (health status, body mass index), and personality scales (neuroticism, mastery, anxiety, optimism). The three methods (LR, DT, RF) will be compared for predictive accuracy in terms of area under the curve (AUC) estimates and receiver operating characteristic (ROC) curves.

Dr. Marco Aldi [VCU], Mathematical Aspects of Quantum Complexity Theory

Abstract: In classical computing devices information is stored in strings of fundamental binary states. In quantum computing the fundamental units of information are represented by physical states of certain quantum mechanical systems. The study of computation complexity in the context of quantum computers presents numerous mathematical challenges. After a general overview of the subject, in this talk we describe some mathematical results concerning a quantum generalization of the classical satisfiability problem.

Wesley Davis served as the main organizer of the conference. Samuel Gedon, Charlie Armstrong, and Katie Rafferty also assisted in organizing. Ray Cheng was the faculty advisor. Reflecting on this year’s event, Wesley comments that “we had a wonderful conference this year and we would like to thank everyone who made this event wonderful. We hope to see
Publications and Accepted papers by the Math & Stat Faculty
January 2018   February 2019

John Adam:
1. Shape Resonances of the Transverse Magnetic Mode in a Spherically Stratified Medi
   (with U. Nuntaplook), International journal of Applied Physics and Mathematics, 8(3),
2. Review of “The Beauty of Numbers in Nature” by Ian Stewart. SIAM Review 60(4),
   Teacher, 45(1), 17 – 21, (Fall 2018 issue)

Przemyslaw Bogacki:
1. Linear Algebra: Concepts and Applications, American Mathematical
   Society (March 2019)

Rao Chaganty:
1. Hierarchical Archimedean copula models for the analysis of binary familial data, Statistics
   in Medicine, 37, pp. 590-597, with Y. Deng, (2018).
2. A Doubly-Inflated Poisson Distribution and Regression Model, Modern Statistical Methods
   for Spatial and Multivariate Data, STEAM-H Series, Springer, with M. Sheth-Chandra and

Raymond Cheng:
1. Convergence of the best linear predictor of a weakly stationary random field, Journal of
2. Optimal Weak Parallelogram Constants for L^p, Mathematical Inequalities and applications,
3. Linear Functions and Zero Sets for L^p_A, Transactions of the American Mathematical

Norou Diawara:
1. Doubly-inflated Poisson model using Gaussian copula, Communications in Statistics-
   Journal of Statistics and Probability, Vol. 7 (2), pp. 80-90,
3. The Use of Item Response Theory in Survey Methodology: Application in Seat Belt Data,
4. New Approaches to Model Simulated Spatio-Temporal Moran's Index,” Journal of
   Probability.
5. Time Dependent Attribute-Level Best Worst Discrete Choice Experiments”, Big Data and

Fang Hu
1. On the use of a Prandtl-Glauert-Lorentz transformation for acoustic scattering by rigid
   bodies with a uniform flow, Journal of Sound and Vibration, Vol. 443, 198-211, with
3. Simulation of Sound Absorption by Scattering Bodies Treated with Acoustic Liners Using
   a Time-Domain Boundary Element Method, AIAA paper 2018-2356, with M.E. Pizzo and
**Sookyung Joo:**

**Glenn Lasseigne:**

**Li-Shi Luo:**

**Kayoung Park:**

**Ke Shi:**

**Katherine Smith:**
1. Supporting Student Veterans Along the Engineering Degree Pathway, 2018 Fleet Maintenance & Modernization Symposium. Virginia Beach, VA, September 17-20, 2018, with Tamhane, A., Smith, K., Dean, A., Shen, Y.
2. Incorporating Diegetic Elements to Increase Engagement in Games for Engineering Education, 2018 ASEE Annual Conference & Exposition, with Zhu, Z., Shen Y., Lin, C., Ren and Dean A.
3. Design of A Virtual Laboratory for Automation Control, 2018 ASEE Annual Conference & Exposition, with Zhu, Z., Shen Y., Lin, C., Ren, K., Dean A.

**Lucia Tabacu:**

**Xiang Xu:**
Publications and Accepted Papers Cont’:

Yuesheng Xu:
1. A higher-order polynomial method for SPECT reconstruction, IEEE Transactions on Medical Imaging, published online, 2018, with Y. Jiang and S. Li.

Nail Yamaleev:

Ruhai Zhou:

Passing away of two Math Professors:

Ms. Sue Doviak, Senior Lecturer Emeritus, who retired in 2017, passed away this year. She joined the Dept. of Mathematics & Statistics in 1988 and was promoted to Senior Lecturer in 2009. Sue has been active in various work with many campus groups to provide remedial instructional in mathematics.

Mr. Mark Lesley, Associate Professor Emeritus, who retired in 1997, passed away this year. Prof. Lesley received his BS ('58) and MS ('60) degree from American University of Beirut. He joined the Department of Mathematics and Statistics of ODU in 1964 as Assistant Professor of Mathematics. He was promoted to the rank of Associate Professor in 1977. He served as Assistant Chairman from 1975 to 1997. He was a passionate teacher who influenced many students to choose a career in mathematics.
Officers

Hideaki Kaneko – Chair
Yuesheng Xu – Associate Chair of Research
Gordon Melrose – Assistant Chair of Instruction
Ruhai Zhou – Graduate Program Director
Rao Chaganty—Statistics Program Director
Bob Strozak – Chief Departmental Advisor
Przemek Bogacki – Director of Online Instruction
Yan Peng – Coordinator of the Richard F. Barry Colloquium Series

Anyone who has suggestions for the fall and Spring seminar speakers, contact Yan Peng at ypeng@odu.edu.

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