Kimberly A. Roth

Curriculum Vitae

Department of Mathematics

Juniata College

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Education

Masters of Applied Statistics, Pennsylvania State University, Fall 2016

PhD., Mathematics, Pennsylvania State University, Summer 2002

Advisor: Grzegorz Świątek

Budapest Semesters in Mathematics, Fall 1996 and Spring 1997

B.A., Mathematics, Oberlin College, Spring 1996

Minor: Computer Science

Professional Experience

Statistical Consultant, Contamination Source Investigation, Fall 2019- present

Helped with various statistical procedures including establishing Level of Detection and modeling probabilities of testing people positive with pooled and unpooled testing.

Statistical Consultant, Wright Labs, Fall 2019- present

Worked with implementing and analyzing output from various statistical routines including SparCC and SourceTracker.

Professor, since Fall 2016, Juniata College, Fall 2006- present

Taught Quantitative Methods, Introduction to Data Science, Linear Algebra, Calculus I, Calculus II, Calculus III, Introduction to Probability and Statistics, Statistical Consulting, Numerical Analysis, Probability, Probability and Statistics,Multivariate Statistics, Chaos and Fractals, Differential Equations, Bayesian Statistics and Mathematics Research. Co-developed Juniata's program in Data Science. Advised students, co-advised the math club and knitting club, and served on General Education Steering Committee, Student Academic Development, Curriculum Committee, Faculty Governance Committee, a Middle States Working Group, the Science in Motion Advisory Committee, Mellon Grant Group in Integrative and Applied Learning co-chair, Summer Inquiry groups, and the Q assessment committee. Lead Integrated Science Learning Community as part of the past HHMI grant. Currently member of Committee on Advancement and Marketing.

Assistant Professor, Wheeling Jesuit University, Fall 2002 - Spring 2006

Taught Math in Society, Precalculus, Calculus I, Calculus II, Calculus III, Discrete Math, Linear Algebra, Introduction to Research Seminar, Introduction to Real Variables, Freshman Year Seminar, and Sophomore Honors Seminar. Advised students, mentored senior theses, and did service within my department and in the university.

Honors and Awards

Robert V. Hogg Award for Excellence in Teaching Introductory Statistics-national award from the Special Interest Group of the Mathematical Association of America (SIG-MAA) on Statistics Education. January 2019.

Math and the Microbiome Innovation Award for Organization of Inter-kingdom microbial communities from the Mathematical Biosciences Institute at Ohio State with Matt

Anderson, Rick Ballweg, Chiranjit Mukherjee, Denise Russi Rodrigues, Christine Sun, and Yan Zhang. Fall 2018.

SoTL grant from Juniata College for "What is the most effective format for practice and feedback for Calculus I students at Juniata" with Kristin Camenga, Summer 2018.

SoTL grant from Juniata College for Calculus precalculus review project with Henry Escuadro, Summer 2015 and 2016.

HHMI Summer Research Grant with Gina Lamendella, "What Are the Comparative Effects of Metronidazole, Vancomycin and Fidaxomicin on Host Associated Gut Microbial Communities?" Summer 2016.

HHMI Summer Research Grant with Gina Lamendella, "Modeling the degredation potential of groundwater microbial communities using multi-omics data sets." Summer 2015.

Course revision grant for finding and including genomics data in Introduction to Probability and Statistics, part of the HHMi funded genomics initiative at Juniata college, August 2013.

CAUSE grant for attendance at Teaching Introductory Data Analysis through Modeling Workshop at Joint Mathematics Meetings, January 2009 and participation at US Conference on Teaching Statistics, June 2009.

SoTL grant from Juniata College for Calculus clicker project Summer 2008 and Summer 2009

Project NExT Fellow, NExT, which stands for New Experiences in Teaching, is a national year long program of the MAA for new math faculty, Summer 2002 through Summer 2003

Publications

"Hiring a Statistician in a Mathematics Department", MAA FOCUS, October/November 2019.

"The Grieving Mathematician and Mother", Journal of Humanistic Mathematics, Volume 8 Issue 2 (July 2018), pages 172-178. DOI: 10.5642/jhummath.201802.19 . Available at: https://scholarship.claremont.edu/jhm/vol8/iss2/19

"On Becoming a Statistician", MAA FOCUS, December 2017/January 2018.

"Bacterial Community Dynamics in Dichloromethane-Contaminated Groundwater Undergoing Natural Attenuation .", Wright Justin, Kirchner Veronica, Bernard William, Ulrich Nikea, McLimans Christopher, Campa Maria F., Hazen Terry, Macbeth Tamzen, Marabello David, McDermott Jacob, Mackelprang Rachel, Roth Kimberly, Lamendella Regina. Frontiers in Microbiology, Volume 8, 2017.

"The Only Woman in the Room", Juniata Magazine, Fall/Winter 2017.

"The Genomics Leadership Initiative at Juniata College." Buonaccorsi, V.,Roney J., Keeney, J. , Roth, K., Juniata Voices, 2015.

Wrote content for exhibits at the Museum of Mathematics in New York City, NY. Fall 2012.

"Assessing clicker examples versus board examples in Calculus" , PRIMUS, Volume 22, Issue 5, 2012.

"Julia Sets that are Full of Holes", The Mathematical Intelligencer 30 (4), 51-56. "Non-uniform Porosity for a Subset of Some Julia Sets.", Complex Dynamics: Twenty-five Years After the Appearance of the Mandelbrot Set : Proceedings of an AMS-IMS-SIAM Joint Summer Research Conference on Complex Dynamics–Twenty-five Years After the Appearance of the Mandelbrot Set, June 13-17, 2004, Snowbird, Utah Volume 396 of Contemporary mathematics - American Mathematical Society, 2006.

"Teaching outside my comfort zone", Cardinal Perspectives 2004-2005.

Selected Conferences and Talks:

February 2020, "Seeing the Forest for the Trees: Random Forests and Predicting Fracking", Penn State Microbiome Center, State College, PA. https://youtu.be/w0La4iHMyWI

February 2020, "Seeing the Forest for the Trees: Random Forests and Predicting Fracking", Juniata College Math Department Colloquium, Huntingdon, PA.

January 2020, "So You Want to Start an Undergraduate Statistics or Data Science Program?" Panel for SIGMAA StatEd, Joint Mathematics Meetings, Denver, CO.

October 2019, Rustbelt Microbiome Conference, Carnegie Mellon University.

October 2019, "Seeing the Forest for the Trees: Random Forests and Predicting Fracking", California University of Pennsylvania Mathematics Club, California, PA.

October 2019, "Seeing the Forest for the Trees: Random Forests and Predicting Fracking", Franklin and Marshall College and Millersville University Joint Colloquium in Mathematics, Lancaster, PA.

August 2019, "A Mathematician Knits an Afghan." Mathematics of Various Entertaining Subjects, New York City, NY.

April 2019, Allegheny Mountain Section Meeting MAA, Shepherd University.

January 2019, "Effective Practice and Feedback Methods in Calculus I." with Kristen Camenga, Joint Mathematics Meetings, Baltimore, MD.

November 2018, "Classroom Response Systems and Peer Instruction: Two Literature Reviews and a Demo", SoTL brown bag, Juniata College.

October 2018, "Effective Practice and Feedback in Calculus I" with Kristen Camenga, SoTL brown bag, Juniata College.

May 2018, "Introduction to Data Science with No Prerequisites" with Loren Rhodes at the Electronic Conference on Teaching Statistics.

May 2018, 50th Anniversary Conference, Statistics Department, the Pennsylvania State University.

April 2018, Allegheny Mountain Section Meeting MAA, The Behrend College of the Pennsylvania State University.

January 2018, "Introducing R to Different Statistical Audiences". Joint Mathematics Meetings, San Diego, CA.

January 2017, " Reviewing Prerequisite Material for a Course: How and When Should It Be Done?",with Henry Escuadro, SoTL brown bag, Juniata College.

September 2017, "Comparisons", Who is your neighbor?, Juniata College.

May 2017, US Conference on Teaching Statistics, State College, PA.

August 2016, "Reviewing Precalculus in Calculus: Integrated vs. Beginning of Course", Mathfest, Columbus, OH.

June 2016, "Plickers", AP Statistics Best Practices Night, AP statistics reading, Kansas City, MO.

January 2016, "Using Plickers in Introductory Statistics", Joint Mathematics Meetings, Seattle, WA.

August 2015, "Mathematics of Ingress" with Erika Ward (JC '09) , Mathfest, Washington DC.

February 2015, "The Genomics Leadership Initiative at Juniata College", with Vince Buonaccorsi, Jill Keeney, and Jim Roney, Juniata College Bookend Seminar, Huntingdon, PA.

October 2014, "Integrated Review of Precalculus Material in Calculus : a mentoring session" with Henry Escuadro, SoTL brown bag, Juniata College

February 2014, "Analyzing Language in Motion data for K-12 Students" with Deb Roney. SoTL brown bag, Juniata College

January 2014, "Using Genomics Data in Introduction to Probability and Statistics.", Joint Mathematics Meetings, Baltimore, MD

September 2013, "On being an online student" , SoTL brown bag, Juniata College

August 2013, "A Mathematician Teaches Statistics: Tales from the Front Lines" panelist, Mathfest, Hartford, CT.

January 2013, "Communicating in a Statistical Consulting Course" , Joint Mathematics Meetings, San Diego, CA.

August 2012, "Using Good Questions in Calculus", Project NExT breakout session, Project NExT workshop, Madison, WI.

January 2011 "Revising a course to meet the GAISE guidelines", Joint Mathematics Meetings, New Orleans, LA.

August 2010 "Communicating Statistically", Mathfest, Pittsburgh, PA.

April 2010, "Statistical consulting:successes and challenge", Allegheny Mountain Section Meeting,University of Pittsburgh at Johnstown

January 2010, "Clicker examples versus board examples in Calculus: how are they different?", Joint Mathematics Meetings, San Fransisco

August 2009, "Assessing clicker examples versus board examples in Calculus", Mathfest, Portland, OR.

Selected Research Students

Natalie Gibson, Spring 2019, presented at the Juniata Liberal Arts Symposium. Predicting Wolf Genetics in Pennsylvania Coyotes.

Cori Timney, Spring 2019, presented at the Juniata Liberal Arts Symposium. The Fairness of Unique Four-Sided Dice. Presented at the spring meeting of the Allegheny Mountain Section of the Mathematical Association of America.

Andrew Guide, Spring 2018, Predicting Stream Locations using Random Forest Models. Joint work with Gina Lamendella. Presented at the Juniata Liberal Arts Symposium.

Zeph Turner, Spring 2018, Estimating the Sources of Metagenomic Data using Bayesian Statistical Methods. Joint work with Gina Lamendella. Presented at the Juniata Liberal Arts Symposium. Presented at the spring meeting of the Allegheny Mountain Section of the Mathematical Association of America.

Adam Anthony, Spring 2017, Fairness of Skew Dice.Presented at the Juniata Liberal Arts Symposium and at the spring meeting of the Allegheny Mountain Section of the Mathematical Association of America.

Veronica Kirchner, Spring 2017 Random Forest Models for Microbial Communities. Joint work with Gina Lamendella. Presented at the Juniata Liberal Arts Symposium. Presented at the spring meeting of the Allegheny Mountain Section of the Mathematical Association of America. Spring 2016 Time Series Analysis of Bacterial Communities in Water Systems. Joint work with Gina Lamendella and Uma Ramakrishnan. Presented at Juniata Liberal Arts Symposium Summer 2015 Modeling the degradation potential of groundwater microbial communities using multi-omics data sets. Joint work with Gina Lamendella. Presented at Landmark Conference, and Joint Mathematics Meetings Undergraduate Poster Session.

Rebecca Drucker, What Are the Comparative Effects of Metronidazole, Vancomycin and Fidaxomicin on Host Associated Gut Microbial Communities?, Joint work with Gina Lamendella. Summer 2016. Presented at Landmark Conference and Bioinformatics and Genomics Retreat.

Amy Ankney,Fall 2014, Spring 2015, Social Network Analysis of First Year Students, Presented at the Juniata Liberal Arts Symposium. Presented at the spring meeting of the Al-

legheny Mountain Section of the Mathematical Association of America Spring 2014, Analysis of Friendship Networks at Juniata College. Presented at the Juniata Liberal Arts Symposium and at the spring meeting of the Allegheny Mountain Section of the Mathematical Association of America.

Oyinolola Lesi, Spring 2014, Dieception: Die within a die. Presented at the Juniata Liberal Arts Symposium. Presented at the spring meeting of the Allegheny Mountain Section of the Mathematical Association of America.

Victoria Arthur, Spring 2014,A Survey of Statistical Clustering Techniques Using Biological Data. Joint work with Gina Lamendella. Presented at the Juniata Liberal Arts Symposium. Submitted to Undergraduate Statistics Research Project Competition.

Jiazuo Xie, Spring 2012, Time Series Analysis for Shengtai Food Company. Presented at the Juniata Liberal Arts Symposium.

Li Kou (Chloe) Fall 2010 and Spring 2011, Analyzing Admissions Data. Presented at the Juniata Liberal Arts Symposium. Presented at the spring meeting of the Allegheny Mountain Section of the Mathematical Association of America.

Selected Professional Service

Currently Section New Experiences in Teaching Co-coordinator of Allegheny Mountain Section of the Mathematical Association of America/ Past Chair, Chair Elect, First Vice Chair, and Second Vice Chair. Have served on nomination committee, teaching award committee, and service award committee.

Past co-organizer of the Project NExT(New Experiences in Teaching)/Young Mathematicians Network(YMN) poster session at Joint Math Meetings January 2010 to January 2014. Past co-organizer of several panels at the Joint Mathematics Meetings.

Member of MAA Committee on Contributed Paper session. Term 2018-2021.

Past member of the Mathematical Association of America's Committee on the Participation of Women, two three year terms beginning January 2011 and January 2014. Chair for 2015 year. As part of the committee, read TENSOR grant applications, March 2012 and March 2014.

Webmaster of the the Mathematical Associations of America's Special Interest Group of Statistics Education. Past treasurer of the the Mathematical Associations of America's Special Interest Group of Statistics Education for 2012-2014. Have served on the Hogg award committee.

Reader AP Statistics, 2015 -present. Past reader of AP Calculus.

Referee currently for College Math Journal, Problems, Resources, and Issues in Mathematics Undergraduate Studies, Journal of Humanistic Mathematics and Journal of Statistics Education.