

ALYSSA COLUMBUS

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EDUCATION

University of California, Irvine

June 2018

Bachelor of Science with Honors and Distinction, Mathematics – Applied and Computational Math Specialization

PROFESSIONAL EXPERIENCE

Pacific Life Insurance Company

Newport Beach, CA

Data Scientist

October 2018 - Present

- Automating analytical procedures and pipelines for the actuarial product analytics team using R and AWS.
- Building reports and interactive R Shiny dashboards (web applications) to compare sales of annuities and funds over time from broker dealer, product, and rider perspectives.
- Developing predictive analytics/machine learning educational curricula for actuaries and data scientists.

Data Science Intern

June 2018 - September 2018

- Earned 1st place in the company-wide Predictive Modeling Contest using machine learning to predict client lapses on GMWB rider contracts.
- Consulted with mid- and senior-level executives on how to most effectively use open source software and cloud computing technologies for business intelligence.
- Wrote curricula for the Director of Actuarial Analytics' weekly predictive modeling lectures to all interns.
- Selected from more than 500 applicants to be a part of the first class of data science interns.

NASA - National Aeronautics and Space Administration

Remote

Datanaut

January 2018 - Present

- Selected as 1 of 50 people (and 1 of 11 students) worldwide to be in the Spring 2018 Class of NASA Datanauts.
- Collaborating with software engineers, data scientists, and students from around the world to develop new insights and tools from NASA's open data.

RESEARCH EXPERIENCE

The Athena Breast Health Network at UC Irvine

Irvine, CA

Undergraduate Researcher

September 2016 - June 2018

Advisors: Dr. Argyrios Ziogas, Dr. Hannah Lui Park, Dr. Hoda Anton-Culver

- Developed R scripts to clean, code, and process large datasets through breast cancer risk assessment models in R, SAS, and at the command line.
- Visualized risk model correlations and comparisons in R and R Shiny.
- Built and tested machine learning models to have 71-98% greater accuracy than established breast cancer risk assessment models.
- Wrote technical reports and grant applications; thrice awarded UROP, SURP fellowships totaling \$2250 from the Undergraduate Research Opportunities Program (UROP).
- Selected to present results from studies at five scientific conferences.

Rose, Mueller, and Greer Labs

Irvine, CA

Research Assistant

March 2015 - September 2015

Advisors: Dr. Michael Rose, Dr. Laurence Mueller, Dr. Lee Greer

- Recognized a flaw in the standard method of data collection and wrote an ImageJ macro that lowered false positive rates by 20% and addressed a previously unidentified cause of discrepancy in the data.
- Increased efficiency of collecting data from assays of *Drosophila* viability, mate choice, and fecundity under various levels of urea and ammonia stressors; results were used to study speciation, aging, and social behavior.

PUBLICATIONS AND PRESENTATIONS

Books

- **Columbus, A.** *How to Use R with Excel: A Comprehensive Guide to Transitioning from Excel to R*, published July 2018.
- **Columbus, A.** *Data Storytelling with R*, in preparation to be published June 2019.

Articles

- **Columbus, A**, Ziogas, A, Park, HL. *Machine Learning Techniques for Breast Cancer Risk Assessment Models*. In Preparation.
- Park, HL, **Columbus, A**, Athena Breast Health Network Investigators and Advocate Partners, Kelly, R, Alvarez, A, Goodman, D, Larsen, K, Ziogas, A, Anton-Culver, H. *Breast Cancer Risk Assessment in a Multiethnic Patient Population*. In Preparation.

Talks and Poster Presentations

- **Columbus, A**, Ziogas, A, Park, HL. *Comparison of Breast Cancer Risk Assessment Models for a Multiethnic Patient Population*. Talk and Poster Presentation at Undergraduate Research Opportunities Program Symposium, Irvine, CA, May 20, 2017, and Speed Session Talk and Poster Presentation at Women in Statistics and Data Science Conference, La Jolla, CA, October 19, 2017.
- Park, HL, **Columbus, A**, Athena Breast Health Network Investigators and Advocate Partners, Kelly, R, Alvarez, A, Goodman, D, Larsen, K, Ziogas, A, Anton-Culver, H. *Breast Cancer Risk Assessment in a Multiethnic Patient Population*. Poster Presentation at San Antonio Breast Cancer Symposium, San Antonio, TX, December 7, 2017.
- **Columbus, A**, Ziogas, A, Park, HL. *Probabilistic Models, Machine Learning, and the Future of Breast Cancer Risk Assessment*. Talk at Joint Mathematics Meetings, San Diego, CA, January 11, 2018.
- **Columbus, A.** *My Research in Mathematics*. Invited Talk at Anteater Mathematics Club, Irvine, CA, February 12, 2018.
- **Columbus, A**, Ziogas, A, Park, HL. *Statistical Modelling of Breast Cancer Risk for Greater Predictive Accuracy*. Talk at SIAM Conference on Uncertainty Quantification, Garden Grove, CA, April 17, 2018.
- **Columbus, A.** *NASA Data Science for Space Research and Exploration*. Workshop at Anteater Mathematics Club, Irvine, CA, May 7, 2018.
- **Columbus, A.** *R-Ladies Irvine Kickoff*. Talk at R-Ladies Irvine, Irvine, CA, May 16, 2018.
- **Columbus, A**, Ziogas, A, Park, HL. *Machine Learning Techniques for Breast Cancer Risk Assessment Models*. Talk at Undergraduate Research Opportunities Program Symposium, Irvine, CA, May 19, 2018.
- **Columbus, A.** *Navigating the Tidyverse: ggplot2*. Tutorial at R-Ladies Irvine, Irvine, CA, June 27, 2018.
- **Columbus, A.** *Data Visualization with R Shiny*. Tutorial at O'Reilly Open Source Convention, Portland, OR, July 17, 2018.
- **Columbus, A.** *You Can Be a Scientist Too! Citizen and Data Science at NASA*. Workshop at Girl Scout Council of Orange County, Irvine, CA, July 28, 2018.
- **Columbus, A.** *Telling Meaningful Stories with Data*. Talk at Big Data Day LA, Los Angeles, CA, August 11, 2018.
- **Columbus, A**, Steed, T. *Society of Actuaries Predictive Analytics Training: Introduction to R*. Tutorial at Pacific Life, Newport Beach, CA, September 5, 2018.
- **Columbus, A**, Benz, R, Bauer, M. *Introduction to R*. Tutorial at R-Ladies Irvine, Irvine, CA, October 3, 2018.
- **Columbus, A.** *Data Storytelling and Visualization*. Talk at Pacific Life, Aliso Viejo, CA, October 8, 2018.
- **Columbus, A**, Cruz, M, Bauer, M. *R Markdown and Data Visualization with ggplot2*. Tutorial at R-Ladies Irvine, Irvine, CA, November 14, 2018.
- **Columbus, A**, Steed, T, Huang, T. *Digital Analytics and Insights*. Guest Lecture at UC Irvine M.S. in Business Analytics Course, Irvine, CA, November 19, 2018.

- **Columbus, A.** *Telling Meaningful Stories with Data*. Talk at Orange County R Users Group, Irvine, CA, November 27, 2018.
- **Columbus, A.** *Rotaract Alumni Career Panel*. Invited Panelist at Rotaract of UC Irvine, Irvine, CA, January 16, 2019.
- **Columbus, A.** *Happy Shiny New Year - Introduction to R Shiny*. Tutorial at R-Ladies Irvine, Irvine, CA, January 30, 2019.
- **Columbus, A.** *Career Discovery Series - Data Science Career Panel*. Invited Panelist at UC Irvine Division of Career Pathways, Irvine, CA, February 26, 2019.
- **Columbus, A.** *Data Storytelling: From Insight to Action*. Talk at Women in Analytics Conference, Menlo Park, CA, April 12, 2019.
- **Columbus, A.** *Data Visualization with R Shiny*. Tutorial at Open Data Science Conference East, Boston, MA, April 2019.
- **Columbus, A.** *Getting Started with R and Docker for Reproducibility and Production*. Tutorial at O'Reilly Open Source Convention, Portland, OR, July 2019.

HONORS AND AWARDS

Career, Leadership, and Service Awards

- Rising Women in Technology Recipient (November 2018).
- Dynamic Women of UC Irvine Nominee (May 2018).
- LinkedIn Accelerate U Los Angeles (September 2017).
- Girl Scout Orange Owl Award (April 2017).
- UC Irvine SSARC IMPACT Leadership Certificate (May 2015).
- Girl Scout Gold Award (June 2014).
- Juliette Low Spirit of Girl Scouting Award (June 2014).

Academic Awards

- Phi Beta Kappa (June 2018).
- Pi Mu Epsilon (June 2018).
- Chancellor's Award of Distinction (June 2018).
- Undergraduate Research Opportunities Program Fellowship for 2017-18 Academic Year (January 2018).
- Summer Undergraduate Research Program Fellowship for 2017 Summer (June 2017).
- Undergraduate Research Opportunities Program Fellowship for 2016-17 Academic Year (January 2017).
- Dean's Honor List (9/12 Academic Quarters).

Contests

- First Place, Society of Actuaries Data Analysis Contest (January 2019).
- First Place, Pacific Life Predictive Modeling Contest (August 2018).
- First Place, March Madness Bracket Competition (April 2018).

TEACHING EXPERIENCE

Girl Scouts of Orange County

STEM Consortium Workshop Leader and Volunteer

Irvine, CA

June 2014 - Present

- Creating and leading STEM workshops for local Girl Scouts at the Girl Scout Council of Orange County.
- Mentoring younger girls to pursue STEM careers.

UC Irvine Department of Electrical Engineering and Computer Science

Teaching Assistant and Grader

Irvine, CA

April 2018 - June 2018

- Invited to help teach and grade assembly language and C code for EECS 113, a course on the Internet of Things, microcontrollers, and hardware and software interaction.

Mathnasium

Instructor

Orange, CA

September 2015 - February 2016

- Contributed to the creation of a productive and engaging learning environment by tracking the progress of each student's math comprehension and encouraging them to pursue careers in STEM.

TECHNICAL SKILLS

Platforms: Mac, Windows, Linux.

Tools: R, Python, SQL, SAS, MATLAB, Mathematica, L^AT_EX, HTML, CSS, JavaScript, ImageJ, LabVIEW, C, Assembly, Bash, Git, Amazon Web Services (AWS), Tableau, Google AdWords and Analytics, Salesforce.

Hardware: Arduino, Raspberry Pi.

SOFTWARE

aws.s3: An R package for the Amazon Web Services (AWS) Simple Storage Service (S3) REST API.

aws.ec2: An R package for the Amazon Web Services (AWS) Elastic Cloud Compute (EC2) REST API.

For more projects, please see my *Portfolio* and *GitHub*.

COMMUNITY AND UNIVERSITY SERVICE

Institute of Electrical and Electronics Engineers (IEEE)

Standard for Algorithmic Bias Considerations Working Group

Standard for Personal Data AI Agent Working Group

Remote

January 2019 - Present

January 2019 - Present

R-Ladies Global

Founder, R-Ladies Irvine

Abstract Reviewer

Irvine, CA

March 2018 - Present

September 2017 - Present

Scientific Computing with Python (SciPy)

Program Committee

Remote

February 2018 - Present

Journal of Open Source Software (JOSS)

Reviewer

Remote

December 2017 - Present

rOpenSci

Community Member and Package Reviewer

Remote

September 2017 - Present

University of California, Irvine

School of Physical Sciences Mentor

Disability Services Center Note Provider

Mathcounts Proctor

Science Olympiad Test Writer, Proctor, and Grader

Irvine, CA

October 2018 - Present

April 2016 - June 2018

March 2015 - March 2018

February 2015 - February 2018