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Alyssa Frazee

Education

2010–2015 **PhD in Biostatistics**, *Johns Hopkins Bloomberg School of Public Health*, Baltimore, MD.
Dissertation research topic: genomics and computational biology, focusing on statistical methods and software for differential expression analysis of RNA sequencing data. Advisor: Jeff Leek

2006–2010 **BA in Mathematics**, *St. Olaf College*, Northfield, MN.
Summa cum laude; distinction in Statistics

Scientific Publications

Published Frazee AC, Sabunciyan S, Hansen KD, Irizarry RA, and Leek JT (2014). "Differential expression analysis of RNA-seq data at single-base resolution." *Biostatistics* 15(3): 413-426.

Frazee AC, Langmead B, and Leek JT (2011). "ReCount: A multi-experiment resource of analysis-ready RNA-seq gene count datasets." *BMC Bioinformatics* 12:449.

Under Revision Frazee AC, Pertea G, Jaffe AE, Langmead B, Salzberg SL, Leek JT (2014). "Flexible isoform-level differential expression analysis with Ballgown." Under revision at *Nature Biotechnology*.

Frazee AC, Jaffe AE, Langmead B, Leek JT (2014). "Polyester: simulating RNA-seq datasets with differential transcript expression." Under revision at *Bioinformatics*.

Book Chapter Frazee AC, Collado Torres L, Jaffe AE, Langmead B, Leek JT (2014). "Measurement, Summary, and Methodological Variation in RNA-sequencing" in S. Datta and D. Nettleton (Eds.), Statistical Analysis of Next Generation Sequencing Data (115-128): Springer.

Work Experience

Summer 2013 **Hacker School**, New York, NY.
12-week, collaborative project-based program for improving software development skills. Projects included an interactive card game in Python, a Flask web application, a teaching assistant scheduling application written using Python and the Google Calendar API (used by the 500-student Johns Hopkins course for which I was a lab instructor), and an extension for Sublime Text.

Summer 2009 **NSF Undergraduate Researcher**, *James Madison University*, Harrisonburg, VA.
Improved a statistical method for assessing environmental health of streams.

Summer 2007 and 2008 **Intern / Technical Aide**, *3M*, St. Paul, MN.
Assisted researchers with laboratory bench work in photolithography and nanofabrication.

Technical Skills

proficient R, Python, Git, Linux, Shell scripting, LaTeX

surface knowledge [used infrequently in current work] SQL, C++, Stata, SAS, D3.js, HTML/CSS, AWS

Programming Endeavors

Spring 2014 **ROpenSci Hackathon**, San Francisco, CA.
2-day hackathon with members of the R community committed to open-access scientific research. Contributed to a suite of R unit tests for tabular data ("testdat").

Scientific Software Projects
Primary developer/maintainer of *Ballgown*, a published Bioconductor package for visualization and statistical analysis of RNA-seq data; primary developer/maintainer of *Polyester*, a lightweight RNA-seq read simulator (under review for Bioconductor); developer of alpha version of *DER Finder*, an R package for finding **D**ifferentially **E**xpressed **R**egions in the genome at high resolution. These packages are all open-source and were released with corresponding scientific publications.

Side Projects
Outside of PhD research, collected and analyzed data on the gender of GitHub repository owners using the Python data analysis stack and D3.js (blog post about this project was featured in FiveThirtyEight's weekly roundup of best data journalism), built a web application with R and Shiny for checking validity of an exam committee according to university rules, and created a small R package ("RSkittleBrewer") for making graphics with Skittles color schemes.

Awards

2012–2015 **Hopkins Sommer Scholarship**.
Provides research funding and leadership training to one PhD student per cohort, per department at the Johns Hopkins Bloomberg School of Public Health

2014 **First Prize in Delta Omega Poster Competition**, *Applied Science Category*.
School-wide research poster competition; categories were Applied Science and Laboratory Science

2012 **Helen Abbey Award**.
Departmental award for excellence in teaching

2010 **Gertrude Cox Scholarship Winner**.
American Statistical Association scholarship for early-career women in statistics

2006–2010 **Undergraduate Awards**.
Phi Beta Kappa, Barry Goldwater Scholarship Honorable Mention (award for undergraduates pursuing research in STEM fields), three one-year NSF research fellowships for projects with St. Olaf Center for Interdisciplinary Research, Buntrock academic scholarship (top academic scholarship for St. Olaf students), Miles Johnson Award for outstanding contributions to the St. Olaf Band, National Merit Scholarship

Speaking

Invited Talks **RADIANT Workshop at the European Conference on Computational Biology**, Strasbourg, France, September 2014.

BioC 2014, Boston, MA, August 2014.
Annual developer meeting for Bioconductor, a major collaborative repository of open-source bioinformatics software

High School Outreach Program, Johns Hopkins Biology Department, July 2014.

Summer Undergraduate Research Program, Mathematics and Statistics Department, James Madison University, June 2014.

St. Olaf College seminar series, Mathematics, Statistics, and Computer Science department, November 2013.

Johns Hopkins Young Investigators Symposium on Genomics and Bioinformatics, October 2013.

Contributed Talks

ENAR Spring Meetings (2013 and 2014), Topic-contributed talk at Joint Statistical Meetings (2014), contributed posters at Statistical Methods for Very Large Datasets Conference (2011) and Statistical and Quantitative Genetics Conference (2013).

Teaching

2013–2015 Lab instructor for 500-student, masters-level biostatistics course at Johns Hopkins

2011–2012, 2014 Lead teaching assistant for 100-student biostatistics course for medical and public health practicitioners at Johns Hopkins; forum moderator for Coursera version in 2014

2012–2013 Statistical consultant for Masters in Public Health students at Johns Hopkins

Service

2012–2014 Mentor to Baltimore City high school student

2012–2013 Organizer, "tea time": weekly social hour and seminar discussion for Johns Hopkins biostatistics department

2012 Session chair, Joint Statistical Meetings, San Diego

2011–2012 Organizer, student computing club, Johns Hopkins biostatistics department