

Education

University of Texas at Austin

PhD in Neuroscience, 2014

Doctoral Advisor: Richard W. Aldrich

Washington and Lee University

BS in Physics, *magna cum laude*, 2009

Experience

Machine Learning Engineer, Senior Manager - Capital One - 2017 to Present

- Lead technical projects the Center for Machine Learning in domains including time series anomaly detection, computer vision and object detection, and malware detection.
- Work with leadership on the development and strategy of Capital One's Center for Machine Learning.

Data Scientist - IronNet Cybersecurity - 2015 to 2017

- Working with a team of brilliant data scientists and developers to build powerful algorithms for anomaly detection on computer networks.
- Using Spark through Scala and Java to create new approaches for large-scale outlier detection and alerting in cyber data. Full lifecycle development of algorithms through R&D, testing and deploying across the enterprise.

Data Scientist - L3 Data Tactics - 2014 to 2015

- Worked on DARPA program to build large-scale machine learning applications for cyber defense and anomaly detection. Used Spark to develop methods for modeling terabyte data sets. Presented results and progress to senior leaders in partnering organizations in government and industry.

Data Science Intern - Civitas Learning - Summer 2013

- Built predictive models of student success in higher education. Designed and built an automated data science framework for analysis of large numbers of population segments.

Research Assistant - laboratory of Richard W. Aldrich - 2010 to 2014

- Developed Bayesian framework for parameter inference in common biophysical settings.
- Pioneered nonparametric Bayesian methods for the analysis of single molecule time series.

Teaching Experience

Adjunct Professor - Georgetown University - 2017 to present

- Develop and teach graduate coursework in Georgetown's Masters in Data Analytics program.
- Teaching ANLY512 Statistical Learning Theory with topics including classification and regression, model evaluation, parametric and nonparametric methods, regularization, and unsupervised methods.
- Curriculum development for upcoming course Artificial Neural Networks and Deep Learning with topics including backprop and SGD, convolutional networks, recurrent networks, and Tensorflow.

Instructor - General Assembly - 2016 to 2017

- Lead instructor for GA's 12-week Data Science part-time course.
- Developed and taught course content surveying fundamental concepts in the Python data science ecosystem. Topics included software skills and git, scikitlearn and machine learning, model evaluation, natural language processing, clustering, neural networks, and distributed computing.
- Gained over 100 hours of instructional classroom time and served as mentor for student-led projects.

Instructor - District Data Labs - 2016 to present

- Developed and taught course materials for advanced data science topics. Courses included:
 - Building Big Data Applications With Apache Spark
 - Introduction to Computational Statistics

Consultant & Instructor - DataSociety - 2015 to present

- Consulted on emerging trends in data science and big data technologies.
- Developed and taught a course for DataSociety's online education platform entitled "Advanced Visualization With R".

Guest Lecturer - University of Texas at Austin

- Scientific Programming Seminar, Spring 2014
- Introduction to Biostatistics, Fall 2014
- Principles of Neuroscience, Fall 2012

Skills

- Python, Scala, R, Spark, Hive, Impala, Hadoop, HTML, javascript (d3), Linux/UNIX, git.
- Bayesian inference, MCMC, Nonparametric Bayes, Bootstrap, time series, HMM, clustering/segmentation, neural networks and deep learning, anomaly detection.

Honors and Awards

- Predoctoral Fellowship, American Heart Association, 2012- 2014
- Complex Systems Summer School, Santa Fe Institute for Complex Systems, 2012
- Student Research Award Finalist, Biophysical Society, 2012

Publications

Hines, K. 2015. A Primer On Bayesian Inference For Biophysical Systems. *Biophysical Journal*. 108(9) 2103-2113.

Hines, K., J. Bankston, R. Aldrich. 2015. Analyzing Single Molecule Time Series Via Nonparametric Bayesian Inference. *Biophysical Journal*. 108(3) 540-556.

Hines, K., T. Middendorf, R. Aldrich. 2014. Determination of Parameter Identifiability in Nonlinear Biophysical Models: A Bayesian Approach. *Journal of General Physiology*. 143(3):401-416.

Hines, K. 2013. Inferring Subunit Stoichiometry from Single Molecule Photobleaching. *Journal of General Physiology*. 141(6):737-746.