

Adrian W. Lange

Scientist + Developer

Employment

Software Developer

August 2013 – Present

Signal (formerly known as BrightTag)

- Developing data models and algorithms to classify/merge multi-channel user data from millions of requests per day
- Improving data analysis scripts/methods for distributed NoSQL database (Cassandra) containing billions of records
- Created real-time anomaly detection and network traffic forecasting system using Fourier analysis (Java, Python); capable of predicting regular traffic patterns a week ahead of time with >90% accuracy

Postdoctoral Appointee

March 2012 – August 2013

Argonne National Laboratory Leadership Computing Facility / University of Chicago

- Optimized and developed novel algorithms for massively parallel physics/chemistry simulations on IBM Blue Gene/Q supercomputer; increased simulation speed more than 8x, scalability to ~0.4 million cores
- Devised new quantum mechanical proton transport model based on electronic structure theory; implemented in highly parallelized molecular dynamics code

Ph.D. Student Researcher

June 2007 – March 2012

The Ohio State University

- Published 10 first author journal articles; total 14 publications, 370+ citations, h-index 7 ([Google Scholar Citations](#))
- Invented mathematical model for solvent electrostatics, geometrical algorithm for constructing molecule surfaces, stochastic optimization for load balancing numerical integrals; applied to simulate excited electrons in DNA
- Contributed linear algebra solvers, force fields, solvent models to quantum chemistry software, [Q-Chem](#)

Education

Ph.D. Computational/Physical Chemistry

June 2007 – March 2012

The Ohio State University

B.S. Chemistry, minor in Microbiology

August 2003 – June 2007

The Ohio State University

Supplemental online courses (Coursera & Udacity): Data science, Machine learning, Web development, Algorithms

Technical Skills

	Languages	Tools/Technologies
Proficient	Java, Python, C/C++, Unix/Linux shell (bash)	NoSQL (Cassandra), git, vim, \LaTeX , MPI, OpenMP
Familiar	R, HTML, CSS, JavaScript (jQuery, node.js), awk	SQL (MySQL), Flask, Guava, Guice

Projects/Additional Experience

View code for projects below at my GitHub: github.com/awlange

- **MathWorkers** (2014–Present): Open-source parallel JavaScript math library built around HTML5 Web Workers; intended for speeding up client-side/in-browser computations. (JavaScript)
- **PiPlayer** (2014): Flask web app for streaming music from external hard drive at home, connected through a RaspberryPi computer. (Python, Flask, JavaScript/jQuery/AJAX, HTML, CSS)
- **Personal Website** (2013–Present): adrianlange.com; Back-end to front-end from scratch; dynamic content blog (HTML, CSS/SCSS, JavaScript/jQuery/node.js, MySQL)
- **Project Euler** (2013–Present): Recreational mathematics and programming problems from projecteuler.net; currently solved over 100 problems (C++, Python)

Honors and Awards

- Chair's Prime Choice in Computational Division at American Chemical Society Conference (2013)
- Presidential Fellowship from The Ohio State University Graduate School (2011 - 2012; \$33,150)
- Chemical Computing Group Research Excellence Award from American Chemical Society (2012; \$1,150)
- U.S. Department of Energy Merit Scholarship for top poster presentation (2010; \$400)