

Adrian Lange, PhD

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adrianlange.com

employment

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|--|---|
| Lead Data Scientist
<i>GE Transportation</i> | September 2016 – Present
Chicago, IL |
| <ul style="list-style-type: none">• Create descriptive/predictive analytics solutions for railroad customer performance (e.g. fuel optimization) utilizing modern machine learning and big data technologies [Python, Spark, Hadoop, Cassandra, Zeppelin] | |
| Big Data Engineer, iTunes Analytics
<i>Apple</i> | May 2015 – August 2016
Cupertino, CA |
| <ul style="list-style-type: none">• Developed data science methodology and analytics infrastructure to generate insights into customer experiences on products such as the App Store, Apple TV, and Apple Music [Java, Python, Splunk, Cassandra, Spark, Hadoop] | |
| Software Developer
<i>Signal (formerly known as BrightTag)</i> | August 2013 – April 2015
Chicago, IL |
| <ul style="list-style-type: none">• Developed data models, algorithms, and back-end services to build and analyze user profile networks for millions of daily users; stored in NoSQL database with billions of records (~50 TB) [Java, Cassandra, Python, Spark] | |
| Postdoctoral Appointee
<i>Argonne National Laboratory Leadership Computing Facility
University of Chicago</i> | March 2012 – July 2013
Chicago, IL |
| <ul style="list-style-type: none">• Optimized massively parallel physics/chemistry simulations on IBM Blue Gene/Q supercomputer (3 on Top500); increased code speed over 8x, scalability from 1024 to ~0.4 million CPU cores [C++, C, MPI, OpenMP, Python] | |
| PhD Student Researcher
<i>The Ohio State University</i> | June 2007 – March 2012
Columbus, OH |
| <ul style="list-style-type: none">• Researched quantum chemistry and statistical thermodynamics: mathematical theory, computation, and algorithms; published 10 journal articles; presented at 20+ professional/academic events [C++, C, Fortran] | |

technical skills

Category	Proficiency in approximate descending order from left to right
Programming Languages	Java, Python, JavaScript, C++, C, awk, Unix/Linux shell (bash), Fortran, Scala
Web Technologies	HTML, CSS/SCSS, Flask, Node.js, jQuery, Jinja, AJAX, web workers, AWS
Databases/Storage	Cassandra, MySQL, Splunk, HDFS, PostgreSQL, Oracle, Redis, Kafka
Data Analysis/Modeling	pandas, numpy, scikit-learn, SciPy, Keras, TensorFlow, Lasagne, R
Compute Technologies	Spark, Hadoop (MapReduce), Zeppelin, MPI, OpenMP
Productivity Tools	git, vim, IPython/Jupyter, VirtualBox, LaTeX, Charles, svn
Software Engineering	Test Driven Development, architecture design, code review, agile development
Machine Learning Techniques	Neural networks, regression, clustering, DT/RF, SVD/PCA, Bayesian nets, NLP, SVMs

education

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- | | |
|--|---|
| PhD Computational/Physical Chemistry
<i>The Ohio State University</i> | June 2007 – March 2012
Columbus, OH |
| B.S. Chemistry, minor Microbiology
<i>The Ohio State University</i> | August 2003 – June 2007
Columbus, OH |
- Supplemental Online Courses:
- Udacity*: Web Development, Programming Languages, Parallel Programming (GPU), Machine Learning, Deep Learning
- Coursera*: Data Science Signature Track, Machine Learning, Algorithms, Databases, Neural Networks

projects & additional experience

To see some code I have written (including projects below), please visit my GitHub account: github.com/awlange

BrainSparks & Calrissian 2015 – present

Experimental deep learning library; supports MLP, 1D convolution net, [particle network](#) (my personal research); exploring GPU acceleration, data parallelization via Spark on homemade Raspberry Pi cluster [Python, Spark, numpy, PyCUDA]

BaconNet 2015

Web app for classifying pictures of bacon and Kevin Bacon: isitbacon.net; built around a convolution neural network model fit to a sample of Google search images [Python, Flask, Lasagne, HTML, CSS, JavaScript, Bootstrap, D3.js]

MathWorkersJS 2015

Open-source parallel JavaScript math and statistics library built around HTML5 Web Workers and Node.js cluster library capable of speeding up computations on multi-core devices; accompanying documentation website: mathworkersjs.org, available for install on npm [JavaScript, Node.js, HTML, CSS, Python, Flask, Apache Server]

Personal Website 2013 – present

Full stack programming, dynamic blog: adrianlange.com [HTML, CSS, JavaScript, Node.js, MySQL, Skeleton]

Project Euler 2013 – present

Recreational mathematics/programming problems; currently solved more than [110 problems](#) [Python, C++]

open source & community contributions

Python Cassandra Driver 2014

Simple error handling for input server connection list; [python-driver](#) [Python, Cassandra]

Q-Chem 2007 – 2014

Lead author of PCM solvent modeling, QM/MM, parallel linear algebra solvers, and Fast Multipole Method code; software design committee; 7th author of 161 co-authors on software white paper; [Q-Chem](#) [C++, C, Fortran]

LAMMPS 2013

Multi-copy communication interface to open-source molecular dynamics software for parallel tempering/replica exchange; optimized compute kernel for pairwise interactions; [LAMMPS](#) [C++, C, MPI, OpenMP, Python]

selected publications

[Google Scholar Statistics](#): 700+ total citations, h-index 9, 12 first author papers, 1 book chapter

3 of 14 publications (PDFs available at adrianlange.com):

- Yihan Shao, Zhengting Gan, Evgeny Epifanovsky, Andrew T.B. Gilbert, Michael Wormit, Joerg Kussmann, Adrian W. Lange et al. Advances in molecular quantum chemistry contained in the Q-Chem 4 program package *Mol. Phys.* 1-32 (2014).
- Adrian W. Lange and Gregory A. Voth. Multi-state Approach to Chemical Reactivity in Fragment Based Quantum Chemistry Calculations *J. Chem. Theory Comput.* 9, 4018-4025 (2013).
- Adrian W. Lange, Gard Nelson, Christopher Knight, and Gregory A. Voth. Multiscale Molecular Simulations at the Petascale (Parallelization of Reactive Force Field Model for Blue Gene/Q): ALCF-2 Early Science Program Technical Report *Argonne National Laboratory* (2013).

awards & honors

Chair's Prime Choice in Computational Division at American Chemical Society Conference 2013

Presidential Fellowship from The Ohio State University Graduate School (\$33,150) 2012

Chemical Computing Group Research Excellence Award from American Chemical Society (\$1,150) 2012

U.S. Department of Energy Merit Scholarship for top poster presentation (\$300) 2010

American Society for Microbiology Undergraduate Research Fellowship (\$4,000) 2006

Ohio State Arts & Sciences Undergraduate Honors Research Scholarship (\$3,500) 2006