

# Dr. Strangelange or: How I Learned to Stop Worrying and Love the Tech Startup Industry

Adrian Lange  
Industrial Associates Meeting  
University of Chicago  
April 29, 2014

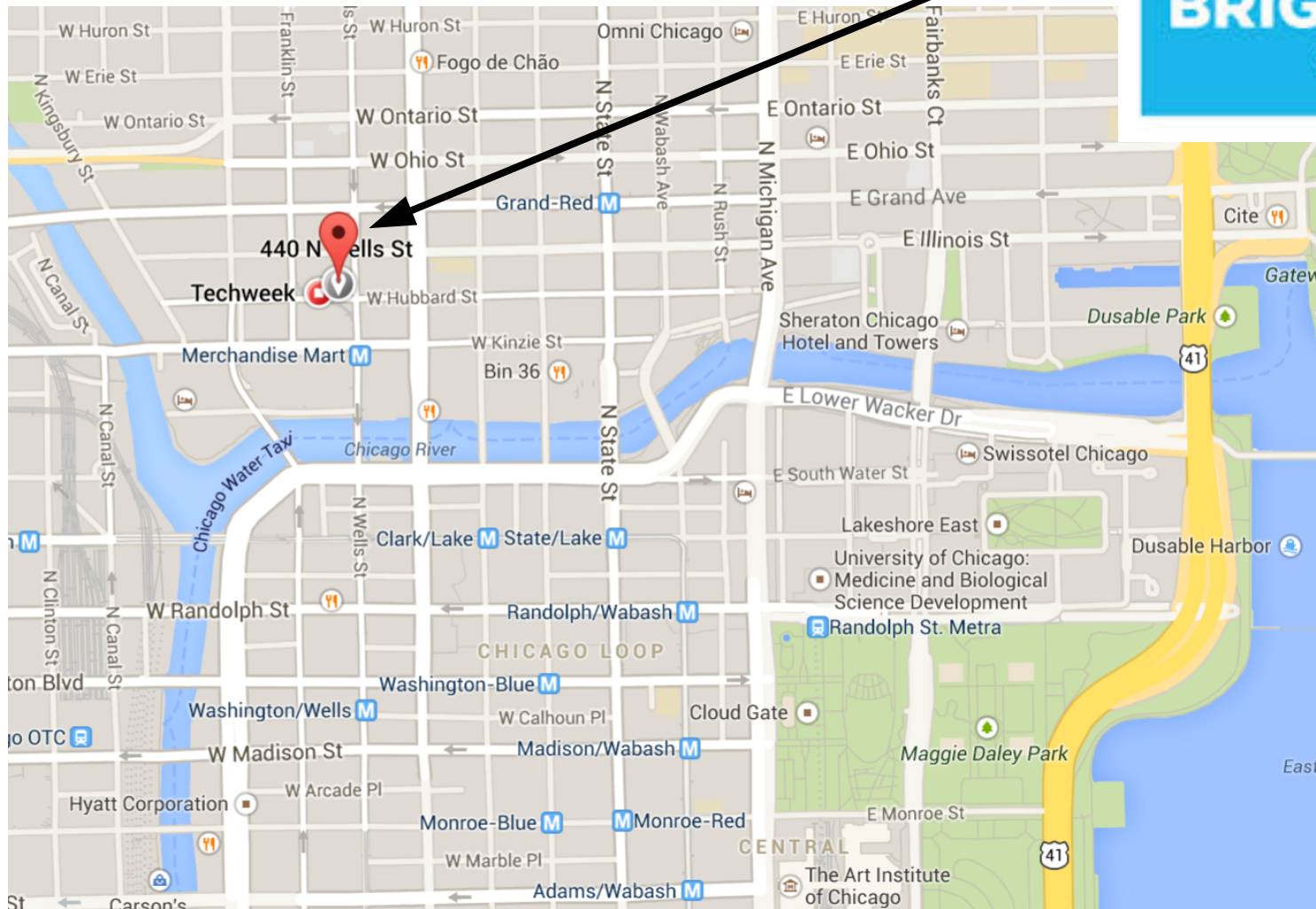
# Questions

- Who am I?
- Where do I work?
- What do I do there?
- Why do I work there?
- How did I get there?

# Who?

- Back-end software developer at BrightTag, Inc. (2013 - current)
- Postdoctoral Appointee at Argonne National Laboratory Leadership Computing Facility / University of Chicago (2012-2013)
- Ph.D. Computational/Physical Chemistry from The Ohio State University (2007-2012)
- Academic scorecard: 12 publications (all 1<sup>st</sup> author, 1 JACS, 300+ citations, h-index 6), paper in review, book chapter pending, co-author of Q-Chem v4.0, 20+ presentations, various awards/honors

# Where?



**BRIGHTTAG**  
One for All™

# Where?

- Software tools for marketing, web analytics, data collection (web tracking), and ad networking
- Notable clients

The logo for Yahoo! Japan, featuring the word "YAHOO!" in red with an exclamation mark, and "JAPAN" in smaller red letters below it.The Etsy logo, consisting of the word "Etsy" in a white, serif font centered within an orange square.The Netflix logo, featuring the word "NETFLIX" in white, bold, sans-serif capital letters on a red rectangular background.The Rue La La logo, featuring the brand name in a black, cursive script.The Puma logo, featuring the word "PUMA" in bold, black, sans-serif capital letters, with a black silhouette of a leaping puma to the right.The Macy's logo, featuring a red five-pointed star to the left of the word "macy's" in a lowercase, black, serif font.The Crate & Barrel logo, featuring the brand name in a black, sans-serif font.The Angie's List logo, featuring the brand name in a black, sans-serif font.The Jimmy John's logo, a circular emblem with "JIMMY JOHN'S" at the top, "Since 1983" on the sides, and "JJ GOURMET SANDWICHES" at the bottom.The Sheraton logo, featuring a stylized "S" inside a laurel wreath.The Sheraton Hotels & Resorts logo, featuring the word "Sheraton" in a bold, black, serif font, with "HOTELS & RESORTS" in a smaller, black, sans-serif font below it.The Gap logo, featuring the word "GAP" in white, sans-serif capital letters on a dark blue square background.The Allstate logo, featuring a circular icon with two hands holding a heart, followed by the word "Allstate" in a bold, blue, sans-serif font, and the tagline "You're in good hands." in a smaller, black, sans-serif font below it.The Kraft logo, featuring the word "Kraft" in a bold, blue, sans-serif font inside a red, horizontally-oriented oval.The Orbitz logo, featuring the word "ORBITZ" in a stylized, blue, sans-serif font with a blue swoosh under the "O".The jetBlue Airways logo, featuring the word "jetBlue" in a bold, blue, sans-serif font, with "AIRWAYS" in a smaller, blue, sans-serif font below it.The Budweiser logo, featuring the word "Budweiser" in a white, cursive script inside a red, diamond-shaped banner with a crown on top.The Aetna logo, featuring the word "aetna" in a bold, purple, sans-serif font.The 1-800 flowers.com logo, featuring a stylized green flower icon, the text "1-800" in green, and "flowers.com" in a black, sans-serif font.The GM logo, featuring the letters "GM" in white, sans-serif capital letters on a blue square background.The North Face logo, featuring the words "THE NORTH FACE" in white, sans-serif capital letters on a red square background, with a white half-dome icon to the right.

# Where?

- Software tools for marketing, web analytics, data collection (web tracking), and ad networking
- Tag Management System
  - Single tag on webpage available to all partner vendors
  - Vendors integrated server-side (patented technology)
  - Data available in real-time
- Fuse
  - Multi-channel and server-direct data collection

# What?

- Back-end, database modeling and algorithms
  - Cassandra NoSQL database (over a billion records)
  - Amazon Web Services server hosting (500+ servers)
  - Server-side performance (3000 queries/second)
  - Languages: Java, Python, bash, JavaScript
- Hack project: real-time anomaly detection/traffic forecasting system
  - On-the-fly Fourier analysis

# Why?

- Disenchanted with academic research
  - Assistant professor? Nope.
- National labs
  - Sequester, shutdown, middle of nowhere
- Industry jobs?



what:

job title, keywords or company

where:

city, state, or zip

Find Jobs



computational chemist  
jobs



[Upload your resume](#) - Let employers find you

Jobs 1 to 10 of 73

73





# Why?

- Disenchanted with academic research
  - Assistant professor? Nope.
- National labs
  - Sequester, shutdown, middle of nowhere
- Industry jobs?
  - Very few, odd locations, mostly pharmaceutical and not my expertise, several non-permanent (postdocs)
  - Applied for a few, rejected!

# Why (leave chemistry)?

- Complex question with no single answer.
- Existential crisis + imposter syndrome
  - High stress, incredibly esoteric, general unhappiness
  - Getting older, people are dying
  - Want fulfilling life, the pursuit of happiness
- Two-body problem: I'm married.
  - Could become many-body problem with children
- Epiphany:
  - I am smart. I can do things. I will not pigeonhole myself.

# Why (leave chemistry)?

- What am I good at that is actually in demand?

**indeed**®  
one search. all jobs.

**what:** software developer  
job title, keywords or company

**where:**  
city, state, or zip

**Find Jobs**

**software developer jobs**

Tip: Enter your zip code in the "where" box to show results in your area.

My recent searches

[Upload your resume](#) - Let employers find you

Jobs 1 to 10 of 74,516

74,516

- Tech startups appealing to me
  - Chicago has a bubbling little scene

# How?

- Diversify skill set
  - Learn things listed in job descriptions
    - Online courses (Coursera, Udacity, etc.), books
- Create web presence
  - LinkedIn, GitHub, BuiltInChicago
  - Built web app for personal site ([adrianlange.com](http://adrianlange.com))
- Résumé
  - Not a CV, 1 page, well organized, no typos
  - Tailor to each job applied to
  - Accomplishments, not responsibilities

# How?

829 S La Grange Rd, Apt A  
La Grange, IL 60525

**ADRIAN W. LANGE**

SCIENTIST + DEVELOPER

[adrianwlange@gmail.com](mailto:adrianwlange@gmail.com)

(330) 289-4955

## EMPLOYMENT

---

<b>Postdoctoral Appointee</b>	<b>Argonne National Laboratory Leadership Computing Facility</b>	<b>March 2012 – Present</b>
-------------------------------	--	-----------------------------

- Developed novel algorithms for massively parallel chemistry simulations on IBM Blue Gene/Q supercomputer
- Increased simulation code speed more than 8x, scalability to ~0.4 million cores (C++, C, Python, MPI, OpenMP)
- Created quantum proton transport model, implemented in Newtonian dynamics interface code (Python, C++, MPI)
- Assisted University of Chicago research group and workshop attendees with running/improving code

---

<b>Ph.D. Student Researcher</b>	<b>The Ohio State University</b>	<b>June 2007 – March 2012</b>
---------------------------------	----------------------------------	-------------------------------

- Published 10 first author journal articles, 230+ total citations, h-index 6 (for listing, see my [Google Scholar Citations](#))
- Presented quantum chemistry research orally over 20 times at professional events/conferences
- Invented new mathematical model for solvent electrostatics, new algorithm for building molecule surfaces
- Implemented force fields, solvent models, parallel linear algebra solvers in [Q-Chem](#) (C++, C, Fortran, MPI, OpenMP)
- Led recitations and conducted exams as teaching assistant for physical chemistry courses

## EDUCATION

---

<b>Columbus, OH</b>	<b>The Ohio State University</b>	<b>August 2003 – March 2012</b>
---------------------	----------------------------------	---------------------------------

- **Ph.D.** Computational/Physical Chemistry, March 2012 (GPA: 3.65)
- **B.S.** Chemistry with minor in Microbiology, June 2007 (GPA: 3.39)
- **Coursework:**
  - Graduate/Undergraduate: Quantum mechanics, Statistical mechanics, Computational chemistry, Multivariable calculus, Linear algebra, Differential equations, Computer programming, Numerical methods
  - Udacity (online): Web development, GPU programming, Programming languages
  - Coursera (online): Machine learning, Data science, Algorithms, Databases

## TECHNICAL SKILLS

- 
- **Proficient:** C++, C, Python, Unix/Linux shell (csh, bash), awk, OpenMP, MPI,  $\text{\LaTeX}$
  - **Familiar:** HTML, CSS, JavaScript, jQuery, SQL, Java, Fortran, Pthreads, CUDA, CVS, SVN, git

## ADDITIONAL EXPERIENCE/PROJECTS

---

View some code I have written at GitHub: <https://github.com/awlange>

- **Q-Chem v4.0** (2009–2013): Lead author of polarizable continuum model and QM/MM codes in commercial software package, [Q-Chem](#); one of six software design committee members (C++, C, Fortran)
- **LAMMPS Ensembles** (2013): Multi-copy communication interface to open-source software, [LAMMPS](#); contributions to main LAMMPS source code (C++, C, MPI, OpenMP, Python)
- **Personal Webpage** (2013): <http://scientistdeveloper.appspot.com/> (HTML, CSS, JavaScript, jQuery, Python)
- **FMO-MS-RMD** (2013): Proton transport fragment simulator; interfaced with Q-Chem (Python, C++, MPI)
- **DESMO** (2011): Highly parallel solvent model code; genetic algorithm dynamic load balancing (C++, OpenMP, MPI)

## HONORS AND AWARDS

- 
- Chair's Prime Choice presentation 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)
  - Travel Fellowship to present at American Conference on Theoretical Chemistry (2011; \$600)
  - U.S. Department of Energy Merit Scholarship for top poster presentation (2010; \$400)
  - American Society for Microbiology Undergraduate Research Fellowship (2006; \$4,000)
  - Ohio State Arts & Sciences Undergraduate Honors Research Scholarship (2006; \$3,500)

# How?

- Tech interviews
  - Phone screen, face-to-face meeting, multi-hour exam
    - Whiteboard coding, algorithms, software design, brain teasers
    - Show knowledge as well as thought process
    - Personality matching
  - “Cracking The Coding Interview” by Gayle Laakmann McDowell, search online for interview questions
  - Practice, study... just like any other exam
- Beyond
  - Wing it

# Questions?

- Find me afterward for further questions
- Or, email me: [adrian.w.lange@gmail.com](mailto:adrian.w.lange@gmail.com)

(me smiling at work)

(whiskey)

