Philip Pham

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Work Experience

Google   **Seattle, WA**
Software Engineer   *August 2016–Present*
- Creating a platform for workflow automation that supports data-driven user interfaces with a domain-specific language for customers to define custom business logic

SessionM   **Boston, MA**
Data Scientist   *July 2012–July 2014*
- Leveraging data and building a reporting infrastructure to drive product design, improve mobile ad targeting, and support sales and marketing
- Selected project experience:
  - *Look-a-like Ad Targeting*: Assisted advertisers in reaching their targeted audiences by implementing a Naïve Bayes model to predict the demographics of users
  - *App Recommendation*: Built a recommendation web service based on collaborative filtering with Apache Mahout and Hadoop to recommend mobile apps to users
  - *Fraud Detection*: Applied a Random Forest model to identify fraudulent transactions

Model N (formerly **LeapFrogRx**)   **Waltham, MA**
Consultant   *July 2011–July 2012*
- Analyzed data for major pharmaceutical companies to develop new sales and marketing strategies
- Selected project experience:
  - *Resource Optimization*: Wrote an adaptive simulated annealing algorithm in C and R that optimized a black box marketing mix model, which resulted in 13% faster growth in drug sales
  - *Launch Sequence Optimization*: Prototyped a tool in Python that allowed business users to interactively set constraints and run optimization algorithms to plan the launch of a drug
  - *Sample Sensitivity*: Classified physicians according to sensitivity to marketing programs and likelihood to prescribe with machine-learning algorithms

Education

University of Pennsylvania   **Philadelphia, PA**
Masters of Arts in Mathematics   *August 2014–May 2016*
- **GPA:** 3.9/4.0 ⋄ **GRE**: 334/340 (Quantitative: 170, Verbal: 164) ⋄ **Math Subject GRE:** 810 (82%)
- **Coursework:** Algebra ⋄ Analysis ⋄ Topology ⋄ Statistics ⋄ Probability
- Wrote thesis on how data dredging invalidates a linear regression: *Just How Easy is it to Cheat a Linear Regression?*

Duke University   **Durham, NC**
Bachelor of Science in Mathematics with minors in Biology and Chemistry   *August 2007–May 2011*
- **GPA:** 3.7/4.0 ⋄ **Major GPA:** 3.8/4.0 ⋄ **SAT**: 2290/2400 (Math: 800, Verbal: 780, Writing: 710)
- **Honors:** Cum Laude ⋄ Completed thesis for Graduation with Distinction ⋄ Team leader of meritorious winning team in 2011 Mathematical Contest in Modeling (MCM)
- **Coursework:**
  - *Number Theory*: researched and presented on p-adic numbers
  - *Numerical Analysis*: compared various numerical optimization methods
  - *Regression Analysis*: modeled the contributions of various factors to student test scores
  - *Experimental Developmental & Molecular Biology*: using *Drosophila* as model a organism, identified the locus of a genetic mutation in by applying statistical methods to microarray results

Salesiana University   **Quito, Ecuador**

Duke in the Andes   *August 2009–December 2009*

Took 4 classes in Spanish with Ecuadorians • Researched Quipus, the ancient Incan system of mathematics • Volunteered 10 hours per week at a nursing home for the poor

RESEARCH

University of Pennsylvania Mathematics Department   **Philadelphia, PA**

Research Assistant   *July 2014–Present*

- Built a C++ web application to search closed captioning text of TV programs (approximately 10 GB of data) with test-driven development, `https://github.com/ppham27/snapstream-reader`
- Created a domain-specific language and interpreter for arbitrary complex queries
- Clustered co-occurences with spring embedding and visualized the clusters in D3

University of Massachusetts Amherst Statistics Department   **Amherst, MA**

Researcher, Programmer   *January 2013–April 2013*

- Implemented in an R package (`https://github.com/ppham27/setsim`), Daeyoung Kim and Bruce G. Lindsay. "Using confidence distribution sampling to visualize confidence sets" Statistica Sinica 21.2 (2011): 923-948. `http://works.bepress.com/daeyoung_kim/1`
- Parallelized sampling algorithm to generate confidence sets
- Vectorized code and rewrote loops in C to improve performance

Duke University Mathematics Department   **Durham, NC**

Undergraduate Researcher, PRUV Fellow   *May 2010–April 2011*

- Modeled kidney behavior in MATLAB and C using partial differential equations
- Exposed model behavior with signal processing and data visualization techniques

PUBLICATIONS

- Mutz, Diana, Robin Pemantle, and Philip Pham. "The perils of balance testing in experimental design: messy analyses of clean data." *The American Statistician*, 2017.
- Layton, Anita T., Philip Pham, and Hwayeon Ryu. "Signal transduction in a compliant short loop of Henle." *International Journal for Numerical Methods in Biomedical Engineering* 28, no. 3 (October 26, 2011): 369-83. `https://onlinelibrary.wiley.com/doi/10.1002/cnm.1475/abstract`

TEACHING & VOLUNTEER EXPERIENCE

Johns Hopkins Center for Talented Youth   **Saratoga Springs, NY**

Teaching Assistant   *June 2016–July 2016*

- Helped teach a Cryptology course to 16 gifted students, ages 12-16
- Course content included elementary number theory, cracking the Enigma, linear algebra, combinatorics, and RSA encryption
- Duties included preparing lessons and lecturing, classroom observation, tutoring students, and supervising children on breaks

University of Pennsylvania Mathematics Department   **Philadelphia, PA**

Teaching Assistant   *August 2014–May 2016*

- **Courses:** Multivariable Calculus ⋄ Linear Algebra and Differential Equations
- Taught 4 recitation sections (20 students per section) that met once per week
- Other duties included grading, substitute lecturing for the professor, tutoring, and exam proctoring

Duke Engage   **Vietnam**

Summer Volunteer   *June 2009–August 2009*

- Led a village summer camp for 50 children, which involved managing 16 university students
- Taught English and planned activities at an orphanage in Saigon with a team of students

PROJECTS, ACTIVITIES, AND INTERESTS

PhillyPham: I wrote a blogging engine from scratch in node.js. I blog about cooking, competitve programming, math, and just life in general. See `http://www.phillypham.com/`.

Cooking: I enjoy cooking healthy paleolithic food as well as treats for others. See `http://www.phillypham.com/?tag=cooking`.

Competitive Programming: In my spare time, I write about basic algorithms used in competitive programming: `http://www.phillypham.com/?tag=algorithm`.

Athletics: I play tennis, do CrossFit, and dabble in gymnastics. I can do a back flip!

Data Visualization: I like to play around with data and try to create visualizations around it: `http://bl.ocks.org/ppham27`.