

NATHAN HATCH

github.com/nhatch

533 W Barry #16A, Chicago, IL 60657, USA ■ nathanhatch297@gmail.com ■ +1 970-297-8081

Mathematical computer scientist interested in doing research after a three-year stint in the software engineering industry.

EDUCATION

University of Chicago

B.S. Mathematics with honors

B.S. Computer Science with honors

GPA: 3.94

Chicago, IL

June 2014

June 2014

Universitat Pompeu Fabra

Study Abroad Program

Barcelona, Spain

January - March 2013

Rocky Mountain High School

Diploma

Fort Collins, CO

May 2010

AWARDS AND HONORS

University of Chicago University Scholarship

2010 - 2014

University of Chicago National Merit Scholarship

2010 - 2014

University of Chicago Dean's List

2010 - 2014

Red Belt, University of Chicago Taekwondo Club

2014

University of Chicago Student Marshal

2013

Phi Beta Kappa

2013

David L. Fulton Prize for Orchestral Excellence

2012

National Honor Society

2009 - 2010

National AP Scholar

2010

RESEARCH EXPERIENCE

Prof. Gregory Shakhnarovich, **Toyota Technological Institute at Chicago**

Chicago, IL

Machine Learning Apprentice

Feb 2015 - present

- github.com/nhatch/casia - Build and train convolutional neural networks for recognizing Chinese characters
 - Manage GPU hardware and software using AWS EC2
 - Compare accuracy when training on two alphabets simultaneously rather than serially
- github.com/nhatch/mnist - Built a 97%-accurate MNIST classifier in Python with NumPy (no deep learning library)

Prof. Paul Sally, **Dept. Mathematics, University of Chicago**

Chicago, IL

Congruent Numbers Seminar Participant

June - July 2012

- Worked with Prof. Paul Sally and 7 other undergraduates to solve problems and present proofs
- Analyzed and verified results on congruent numbers and their relation to elliptic curves

Prof. Peter May, **Dept. Mathematics, University of Chicago**

Chicago, IL

VIGRE REU Apprentice

June - July 2011

- Researched, drafted, revised, and published a 13-page expository paper in mathematics

PUBLICATIONS

Hatch, N. *Group Theory: An Introduction and an Application*. University of Chicago VIGRE REU, 2011.

<<http://www.math.uchicago.edu/~may/VIGRE/VIGRE2011/REUPapers/Hatch.pdf>>.

TEACHING EXPERIENCE

Insight Tutoring

Volunteer Tutor

Chicago, IL

Jan 2015 - present

- Review homework and class material for two economically disadvantaged sixth-grade students
- Creatively re-teach challenging math and reading concepts in an engaging way
- Periodically revisit old material for spaced retrieval practice

Dept. Computer Science, University of Chicago

Homework Grader

Chicago, IL

Oct - Dec 2012

- Graded twice-weekly discrete mathematics problem sets for Prof. Laszlo Babai's graduate-level class
- Earned the position among 25 students based on outstanding performance on "challenge problems"

Dept. Mathematics, University of Chicago

SESAME Teaching Assistant

Chicago, IL

July 2012

- Assisted teaching a class for middle school math teachers on "problem-based learning"

Dept. Mathematics, University of Chicago

Young Scholars Program Counselor

Chicago, IL

June - July 2012

- Tutored four 9th/10th-grade math students in an advanced summer math program
- Reviewed class material and suggested extra problems
- Assisted teaching a class in basic computer programming
- Gave weekly reports on student progress, including helping to write a diagnostic exam

WORK EXPERIENCE

eSpark Learning

Software Engineer

Chicago, IL

June 2014 - present

Full-stack software engineering in a fast-paced startup environment

- Led the annual iOS app release, removing a 300ms tap delay and rewriting the video uploader
- Increased sales pipeline by 12% by integrating our product with Airwatch
- Improved academic fidelity metric from 80% to 87% by refining our app deployment system
- Implemented Apple's "Device Assignment" protocol, making our MDM first-to-market (solo project)
- Built front-end features: student vocab support, device tags, and teacher-assigned practice
- Optimized performance (e.g. one async job 40% faster); reduced lines of code (net -29k); fixed pernicious bugs
- Handled code deployment and error monitoring according to on-call rotation
- Conducted ~20 interviews and code challenge reviews for recruiting

Dept. Computer Science, University of Chicago

chiTCP Developer

Chicago, IL

Oct 2013 - June 2014

- Constructed a TCP-over-TCP daemon for use in Borja Sotomayor's networks class
- Earned the position based on outstanding performance in that class the previous year

Mission Street Manufacturing

Software Intern

Santa Barbara, CA

June - Aug 2013

- Developed prototype front- and back-end software for consumer-friendly 3D printing

TECHNICAL SKILLS

Convolutional neural network (CNN) implementation using Keras / TensorFlow / CUDA
GPU provisioning via Amazon Web Services (g2-, p2-class instances)

Languages: Python, Ruby, Javascript / HTML / CSS, Objective-C, Java, C

Frameworks: Keras, Rails, AngularJS, Cocoa Touch

Platforms: Amazon Web Services, Unix, macOS

Databases: MySQL, PostgreSQL, Redis

Proficient in Spanish

EXTRACURRICULAR ACTIVITIES

Lakeview Symphony Orchestra
Violist

Chicago, IL
Sep 2016 - present

Chicago Metropolitan Symphony Orchestra
Violist

Chicago, IL
March 2015 - Aug 2016

University of Chicago Symphony Orchestra
Principal Violist

Chicago, IL
Sep 2010 - June 2014

University of Chicago Taekwondo Club
Member

Chicago, IL
March 2011 - June 2014

ACM International Collegiate Programming Contest
Participant, University of Chicago Qualifying Round

Chicago, IL
May 2013 and 2014

International destinations visited: United Kingdom, Spain, Argentina, Brazil, Japan, China, Hong Kong, Taiwan, Singapore
Other interests: rock climbing, salsa dancing