

# Naomi Alterman

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## Education

### **Stanford University**

MS, EE (Networking Concentration) // Conferred January 2014

BS, EE (Software Concentration) // Conferred June 2012

## Teaching Experience

**Technical Education Specialist** // University of Washington, eScience Institute  
January 2021 – Present

- Responsible for developing programs and learning materials for the interdisciplinary data science community at the University of Washington
- Research focus on how to build inclusive and engaging communities of practice for computation outside of the CS discipline.

**Adjunct Lecturer** // University of Illinois at Urbana-Champaign, School of Information Sciences

October 2020 – Present

- In the iSchool's lecturer pool specializing in teaching interdisciplinary technical courses.

**Software Engineering Mentor** // Springboard

August 2020 – Present

- Mentor students in a self-directed professional school training them to be world-class full stack web developers
- Responsibilities include weekly one-on-one calls with students to plan and discuss course progress, grading student work, and offering career guidance.

**Instructor** // Bay Area Tutoring Association

July 2020 – Present

- **Coding 5k Workshops**
  - Teach computer science camps over Zoom to cohorts of 8-16 year-olds, focusing on foundational coding skills
  - Curriculum utilizes lessons from Code.org and projects based in MIT's Scratch environment
  - Manage student feedback and coach junior instructors

**Student Retention Consultant** // Make School

September 2019 - October 2019

- **Level Up!**
  - Contracted by a two-year CS college to identify and retain under-performing freshman college students at risk of dropping out
  - Conducted research to find gaps in CS curriculum that less experienced students were stumbling over
  - Designed classroom structures and policies to engage and uplift students struggling with core classes
  - Built lessons and taught lessons for introductory Python, Flask,

- HTML/CSS, MongoDB, and REST APIs
- Designed qualitative and quantitative metrics to track student engagement and performance

**Instructional Fellow // Upperline Code**

July 2019

- **Intensive Programming Bootcamp**
  - Co-taught one-week bootcamp for rising high school sophomores in the SEO Scholars program
  - Introduced students to building web apps using HTML, CSS, Javascript, and the Materialize CSS library

**Assistant Adjunct Professor // Mills College**

January 2019 – April 2019

- **CS180G: Applied Machine Learning**

Offered in conjunction with Google's EngEDU team, helped design and co-teach pilot for 35 hr/week, 10-week bootcamp program introducing students from a variety of majors to machine learning and data science.

Primary responsibilities encompassed:

  - Classroom design: to make an inspiring, safe and productive space for everyone to learn, regardless of background
  - Scheduling and pacing: building varied learning activities to vary the long 7 hour days and make sure content was moving at a good speed for both our advanced students and our struggling learners
  - Student feedback: Experimenting with different ways to get honest, timely, and actionable feedback from our cohort

**Assistant Adjunct Professor // Mills College**

August 2017 – December 2017

- **CS180C/280C: Computer Graphics**

Built interdisciplinary computer graphics elective built from scratch, teaching students both rigorous technical rendering algorithms and fundamentals of digital art.

  - Created and scoped syllabus, produced lecture slides and designed homework assignments
  - Topics covered included image rasterization, 3D projection, GPU architecture, OpenGL and GLSL shaders
  - Graduate level component included readings and analysis of historical and cutting edge research literature
  - Students were responsible for an end-of-semester digital art project based on the skills they learned, which they demoed in a critique circle inspired environment

**Teaching Assistant // Stanford University**

September 2011 – December 2013

- **EE108A: Intro to Digital Systems**

Served two quarters as an undergraduate section leader and three quarters as

head TA for core EE course required for undergraduates

- Wrote and administered new FPGA-based lab assignments
- Taught weekly review sessions tailored to small groups of students
- Developed curriculum changes with professor based on continued experiences teaching course
- Supervised junior course staff
- Provided substitute lectures when professor was absent

## Industry Experience

### **Freelance Software Engineer**

May 2017 – Present

- Major clients and projects include:
  - **Ouster** (2018-2020) – Developing firmware and manufacturing tools for cutting edge LIDAR hardware
  - **Expo** (2017-2019) – Developing native OpenGL implementation of the W3C's 2D Canvas drawing API
  - Other clients include Selfie Networks and Brilliant.org

### **Apple Inc**

Software Engineer, Core OS Networking // January 2016 – May 2017

- Rearchitected TCP/IP stack in Apple's XNU kernel, running on all Apple hardware including Apple Watches, iPhones and Macbooks
- Contributed Python-based build tools and LLDB debugger plug-ins to XNU kernel project

### **Barefoot Networks**

Software Engineer, Compiler Team // November 2013 – December 2015

- Second software employee building innovative SDN startup
- Designed new high-level programming language for unique hardware architecture
- Authored early language specification of P4, a domain specific language for network data-planes (<http://www.p4.org>)
- Principal engineer for multiple components of P4 compiler including packet parser, deparser and backend IR

## Service and Talks

### **Roots, Stems and Leaves**

West Valley College // November 2020 (upcoming)

- Invited to give guest talk for West Valley College's lecture series about career paths in STEM
- Focus on my journey pivoting from a full-time engineer building products to a full-time educator supporting people, and the internal reflection needed to do so
- Slides at:  
[https://docs.google.com/presentation/d/1MSiDZ1UGucnqGiD4HCyIJ\\_yOGY45MqddOjA75AwtoE8/edit?usp=sharing](https://docs.google.com/presentation/d/1MSiDZ1UGucnqGiD4HCyIJ_yOGY45MqddOjA75AwtoE8/edit?usp=sharing)
- Recording at: [https://zoom.us/rec/play/Qyx\\_hPddL5wG2N2nnThB-Q87CP2r3pLTe8k5FE\\_pK9E3TZT85wJ\\_YpPHbgnSuCsbfEiU2RauFTy-9Nyo.EkLw7pFu4HFibBxN](https://zoom.us/rec/play/Qyx_hPddL5wG2N2nnThB-Q87CP2r3pLTe8k5FE_pK9E3TZT85wJ_YpPHbgnSuCsbfEiU2RauFTy-9Nyo.EkLw7pFu4HFibBxN)

### **Volunteer Section Leader** // Stanford University

April 2020 - May 2020

- **Code In Place**
  - Part of a teaching team for Code in Place, offered by Stanford during COVID-19 pandemic, with 10,000 global students and 900 volunteer teachers participating from around the world.
  - Prepared and taught a weekly online discussion section to 10 students in a 5-week introductory Python programming course.
  - Continued professional mentoring relationship with several students post-course to guide them in their skill development.

### **Peer Group Facilitator**

San Mateo Pride Center // February 2019 – Present

- Facilitate biweekly discussion group for transgender and gender-nonconforming individuals over the age of 18
- Perform conflict mediation and provide peer support where necessary
- Collaborate with other Pride Center staff to reevaluate and restructure the group as attendance grows

### **Fantastic Bits and Where to Find Them**

Mills College // October 2018

- Invited to give guest talk for a computer architecture class
- Focus on how techniques and principles from the field have extended to inform the rest of my career and life
- Slides at:  
<https://docs.google.com/presentation/d/1LAnJYcKBnMxu2eBb1sUuqyMqyoC8-t1Qv4LBcZR8Zug/edit?usp=sharing>

### **Computer Graphics, or: How I Learned to Stop Worrying and Love The Matrix**

Mills College // March 2017

- Invited to give talk on the subject of computer graphics

- Geared towards students without a heavy math or CS background
- Slides at: <https://docs.google.com/presentation/d/1Lr6uwenBQiTG3ohgLp-bZ7ZvNkVtWY-cZ8IGitInirw/edit?usp=sharing>

## Publications

### **Ethical Storyboarding for Machine Learning**

(<https://towardsdatascience.com/ethical-storyboarding-for-machine-learning-7c5b5a031173>)

Author of case study about integrating ethics education within an introductory machine learning curriculum

### **P4 Language Specification**

(<https://p4.org/p4-spec/docs/P4-16-v1.0.0-spec.pdf>)

Major contributor to first official language specification

### **DC.p4: Programming the Forwarding Plane of a Data-Center Switch**

*A. Sivaraman, C. Kim, R. Krishnamoorthy, A. Dixit, M. Budiu. SOSR 2014*

(<https://dl.acm.org/doi/10.1145/2774993.2775007>)

Implementation guidance, compiler and tool chain support

## Open Source Software

### **Expo-2D-Context** // <https://github.com/expo/expo-2d-context/>

- Principal engineer for a pure-Javascript implementation of the W3C's Canvas 2D Context graphical API on top of WebGL
- Specialized for use in React Native environments on mobile devices

### **Python Gameboy Emulator** // <https://github.com/naclomi/pygb>

- Implemented an emulator to run Gameboy games while bored in an airport
- Written in pure Python using pygame for input and framebuffer
- Highly object oriented hardware architecture allows use of vanilla Python REPL as a powerful machine code debugger

### **Open vSwitch** // <http://openvswitch.org/>

- Virtual networking switch at the core of many SDN systems
- Contributed MPLS support to Linux kernel module

Awards and  
Honors

**Certificate of Achievement** // Bay Area Tutoring Association // Sep 2020

- In honor of inspirational commitment to volunteer tutoring and dedicated leadership in serving their community
- Endorsed by BATA director Chris Norwood and volunteer engagement coordinator Rose Rastbaf

**Best Technical Achievement** // Stanford CS344 // June 2011

- Awarded for programmable hardware firewall which prevented DDOS attacks on an IPv4 router
- Judged by panel of industry veterans from Broadcom, Google and Cisco

**Best Final Project** // Stanford CS244 // March 2013

- Reproduced networking performance experiment in using Mininet network virtualization technology
- Final report published at:  
<https://reproducingnetworkresearch.wordpress.com/2013/03/12/1216/>