

# Raphael Long

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## EDUCATION

University of Illinois at Urbana Champaign  
B.S. in Computer Science  
May 2021  
4.00/4.00 GPA

Palo Alto High School  
2013-2017  
4.00/4.00 Unweighted GPA

## Relevant Coursework:

Data Structures (CS 225), Discrete Structures (CS 173), Software Design Studio (CS 126)

## EXPERIENCE

### CS 126 Course Staff

- Hosted office hours and code reviews, teaching design principles and test driven development
- Provided feedback and grade students on code readability and structure

Champaign, IL  
Sept. 2018 - Present

### Machine Learning Research (with Phil Long)

- Improved best lower bound on halflines error, a fundamental machine learning problem
- Worked towards matching lower bound with upper bound

Palo Alto, CA  
May 2018 - Present

### Capital One

*Software Engineering Intern*

- Built data visualization tools for internal use using Angular 5
- Restructured SQL database for faster queries

Champaign, IL  
Jan. 2018 - May 2018

### GNU Linux User Group

- Discussed current events in Linux and the open source community
- Organized group purchase of hardware

Champaign, IL  
Sept. 2017 - Present

### Wireless Interference Research (with Minnie Ho)

- Used MATLAB to model propagation of noise in wireless systems
- Analyzed different methods of transmitting data (BPSK, QPSK, etc)

Palo Alto, CA  
Sept. 2016 - May 2017

### FIRST Robotics

*Software Captain (Team 6036), Web Captain (Team 8), Scouting Captain (Team 8)*

- Led team of 4 to develop autonomous and remote control robot code and taught C++, Java, UNIX and Git
- Led team of 5 in web development and taught HTML, CSS, JS and Git
- Developed system to analyze competitor robots' ability and managed 30+ members in competition setting

Palo Alto, CA  
Sept. 2013 - May 2017

## PROJECTS

### N-Dimensional Conway's Game of Life

- Built simulation in C++ using recursive templated class definitions

Apr. 2018 - May 2018

### Facial Recognition

- Used C++ OpenCV facial detection and recognition to pull faces from webcam and tag by name in real time

Apr. 2018 - May 2018

### Procedurally Generated Game Engine

- Constructed framework in Java that pulls descriptive text from JSON files to produce game world
- Supports game saves and is structured for easy additions to game logic

Jan 2018 - Feb. 2018

### Schedule Optimizer

- Generates schedules for students, resolving conflicts and minimizing gaps between classes
- Created production pipeline and algorithm

Sept. 2017 - Dec. 2017

### PygHack Hackathon Participant

- Built app to alert police of illegal parking, especially in handicap spots
- Implemented MongoDB database, back-end API and simple front-end data visualization tool

Sept. 2017 - Sept. 2017

### Arch Linux Workstation Install and Configure

- Configured daemons and dotfiles for personal use

Sept. 2017 - Oct. 2017

### Fairness Research (with Moritz Hardt)

- Analyzed data in Python using numpy to illustrate unexpected bias in machine learning
- Developed mathematical definitions of fairness and prejudice

Nov. 2015 - May 2016

## SKILLS

Proficient in Java, Python (numpy, pandas), C++, Git, UNIX, Javascript (Node, Angular), HTML and CSS  
Experienced with MatLab, SQL, MongoDB and Lua