# Raphael Long

rafilong.com - github.com/rafilong - rafilong42@gmail.com - (650) 630-9731

## 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** — Champaign, IL
- Host office hours and code reviews, teaching design principles and test driven development — Sept. 2018 - Present
- Provide feedback and grade students on code readability and structure

**Machine Learning Research (with Phil Long)** — Palo Alto, CA
- Improved best lower bound on halflines error, a fundamental machine learning problem — May 2018 - Present
- Worked towards matching lower bound with upper bound

**Capital One** — Champaign, IL
*Software Engineering Intern* — Jan. 2018 - May 2018
- Built data visualization tools for internal use using Angular 5
- Restructured SQL database for faster queries

**GNU Linux User Group** — Champaign, IL
- Discussed current events in Linux and the open source community — Sept. 2017 - Present
- Organized group purchase of hardware

**Wireless Interference Research (with Minnie Ho)** — Palo Alto, CA
- Used MATLAB to model propagation of noise in wireless systems — Sept. 2016 - May 2017
- Analyzed different methods of transmitting data (BPSK, QPSK, etc)

**FIRST Robotics** — Palo Alto, CA
*Software Captain (Team 6036), Web Captain (Team 8), Scouting Captain (Team 8)* — Sept. 2013 - May 2017
- 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

## PROJECTS

**N-Dimensional Conway's Game of Life** — Apr. 2018 - May 2018
- Built simulation in C++ using recursive templated class definitions

**Facial Recognition** — Apr. 2018 - May 2018
- Used C++ OpenCV facial detection and recognition to pull faces from webcam and tag by name in real time

**Procedurally Generated Game Engine** — Jan 2018 - Feb. 2018
- 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

**Schedule Optimizer** — Sept. 2017 - Dec. 2017
- Generates schedules for students, resolving conflicts and minimizing gaps between classes
- Created production pipeline and algorithm

**PygHack Hackathon Participant** — Sept. 2017 - Sept. 2017
- 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

**Arch Linux Workstation Install and Configure** — Sept. 2017 - Oct. 2017
- Configured daemons and dotfiles for personal use

**Fairness Research (with Moritz Hardt)** — Nov. 2015 - May 2016
- Analyzed data in Python using numpy to illustrate unexpected bias in machine learning
- Developed mathematical definitions of fairness and prejudice

## SKILLS

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