Allen Cao

allencao@berkeley.edu (510) 935-3270
https://allencaoo.github.io https://www.linkedin.com/in/allen-l-cao https://github.com/AllenCaoo

EDUCATION

University of California, Berkeley **Berkeley, CA**
BA in Computer Science, GPA: 3.876/4.0 *August 2020 - May 2024*

- *Relevant Coursework*: Data Structures, Efficient Algorithms, Computer Architecture, Database Systems (concurrent), Computer Security (concurrent), Artificial Intelligence, Information Devices and Systems, Linear Algebra, Discrete Mathematics and Probability

SKILLS

Programming Languages Python, C/C++, Java, JavaScript, HTML/CSS, SQL, Bash, Solidity, Scheme

Frameworks/Applications Node.js, Express.js, React, NumPy, MySQL, OpenCV, OpenMP, Git, Gerrit, AWS, Linux, Scikit-learn

WORK EXPERIENCE

Baxter International **Deerfield, IL**
Software Development Engineer Intern *June 2022 - August 2022*

- Deployed an interrupt service routine that monitors physical disturbances in medical devices, collects data during interrupts, and logs data to an end-user database in order to fully comply with FDA regulations.
- Upgraded internal API by developing a logging queue and integrating codebase throughout to resolve thread-safety concerns and optimize multi-threading.
- Constructed a streamlined machine learning workflow that includes a data pipeline feeding into a LDA classifier; resulted in a model with near perfect accuracy on testing data.
- Automated GUI quality control by building an OpenCV application to quickly identify missing design requirements from a GUI screenshot.

Leopard Imaging **Fremont, CA**
Software Engineering Intern *May 2021 - August 2021*

- Accelerated the collection of PCB failure data by developing a defect simulation tool that photoshops various defect graphics on PCB images and logs information on said images.
- Created an OpenCV image filter tool that accurately and rapidly identifies faulty PCB components with over 95% correctness.
- Improved user experience of camera tools by integrating setting selections and easily viewable logs using Python (PyQT5 and Tkinter).
- Tested and reported on a camera software tool for a client (Amazon.com) to assure product quality; identified over 20 fatal vulnerabilities.

AnX Robotica Corp **Pleasanton, CA**
Software Engineering Intern *June 2020 - August 2020*

- Worked closely with the Director of Engineering to research solutions addressing imaging issues during MRI scans such as image blurriness, lens distortion, and preventative maintenance.
- Designed algorithms using C++ OpenCV to calibrate and correct distorted lenses in all lens varieties.
- Derived a polynomial regression formula from the correlation between camera lens width and pixel brightness and implemented feature into camera software.

Computer Science Mentors **Berkeley, CA**
Associate Mentor *August 2021 - Present*

- Tutored students enrolled in CS61A (Interpretation of Computer Programs) and CS61B (Data Structures).
- Lectured on concurrent course content and guided students through worksheets during weekly sections.

PROJECTS

Pathfind Visualizer | JavaScript (React), HTML, CSS
https://allencaoo.github.io/Pathfind-Visualizer

- Built interactive React web application that visually displays pathfinding algorithms on a 2D grid.
- Integrated mouse drag interaction feature to visualize algorithms on user-defined mazes.
- Implemented algorithms such as BFS, DFS, Dijkstra's, A*, Greedy Best First Search, Randomized Prim's, and Inverted Randomized Prim's.
- Released the project to over 500 students in UC Berkeley's data structures (CS61BL) course as a visual learning tool for algorithms.

LawScraper | Python (Beautiful Soup), Node.js (Express.js), HTML, CSS

- Built an automated mailing system mainly consisting of a bot that sends emails of newly passed laws web-scraped from government websites to subscribers on a mailing list.
- Implemented a Node.js backend that operates a frontend sign-up page and fetches sign-up data in JSON format.

NumC | C, OpenMP, Intel Streaming SIMD Extensions (SSE)

- Created a library for general, multi-dimensional array computations that accommodates process-intensive scientific computing tasks.
- Used parallel computing techniques such as MIMD (OpenMP) and SIMD (SSE) and caching strategies to offer accelerated matrix computations.
- Supports matrix abs (x50 speedup), addition (x50 speedup), subtraction (x50 speedup), multiply (x60 speedup), power (x1000 speedup), etc.

Gitlet | Java

- Designed and implemented a version control system for local and remote repositories.
- Built an organized hash-based storage system for commits, branches, and remote repositories.
- Supports init, add, commit, rm, log, global-log, status, checkout, branch, rm-branch, reset, merge, add-remote, rm-remote, fetch, push, pull.