Allen Cao

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EDUCATION

University of California, Berkeley — **Berkeley, CA**

BA in Computer Science, GPA: 3.957/4.0 — *August 2020 - May 2023 (Expected)*

EXPERIENCE

UC Berkeley Electrical Engineering & Computer Sciences — **Berkeley, CA**

Academic Intern — *June 2021 - Present*

- Assisted weekly lab sections of two introductory computer science courses, CS61A (Structure and Interpretation of Computer Programs) and CS61B (Data Structures), with 40+ students per lab section.
- Helped students debug or clarify labs assignments and projects involving solving programming puzzles, implementing data structures and algorithms from scratch, and analyzing time complexity.

Leopard Imaging — **Fremont, CA**

Software Engineering Intern — *May 2021 - August 2021*

- Accelerated the collection of printed circuit board assembly (PCBA) failure data by developing a defect simulation tool that photoshops various defects on PCBA images and saves transcripts on said images.
- Created an image filter tool that accurately and rapidly detects faulty wire soldering on PCBAs with over 95 percent correctness on a dataset of PCBA images.
- Used Python (PyQT5 and Tkinter) to improve user interactions with camera tools by integrating setting selections and easily viewable logs.
- Tested and reported on a camera software tool for a client (Amazon.com) to assure product quality; identified over 20 fatal vulnerabilities in the tool.

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 faulty software.
- Used C++ OpenCV to design and implement an algorithm that calibrates and undistorts endoscope fisheye lenses.
- Derived a polynomial regression formula from the correlation between distance from camera lenses to objects and brightness of pixels; implemented this model into software to estimate real world distances during processing of bowel images.

PROJECTS

Pathfind Visualizer | JavaScript (React), HTML, CSS

https://allencaoo.github.io/Pathfind-Visualizer

- Built an online educational React application to visualize pathfinding algorithms on a 2D grid for the purpose of assisting students studying UC Berkeley's data structures course (CS61B).
- Optimized algorithm runtimes to calculate results instantaneously and display visited cells and paths smoothly.
- Visualizable algorithms include BFS, DFS, Dijkstra's, A*, Greedy Best First Search, Randomized Prim's, and Inverted Randomized Prim's (self-discovered).

Escape Stanford: a Maze Escape Game | Java

- Used the StdDraw library to build a 2D world exploration game with pseudo-random seed-based world generation.
- Synchronized user input with refresh rate to maximize smooth gameplay.
- Supports: intermediate mini-games, custom avatars, timer option for mini-games, and multiple levels.

Gitlet | Java

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

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 an Express.js backend that operates a frontend sign-up page and fetches sign-up data in JSON format.

Scheme Shell | Python, Scheme

- Implemented a Scheme interactive interpreter that displays results of single Scheme commands in the terminal.
- Procedures include: define, if, cond, and, or, let, begin, lambda, quote, cond, car, cdr, cons, enumerate, merge, nondecreaselist.

SKILLS

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

Frameworks/Applications NumPy, OpenCV, Node.js, Express.js, React, JUnit, Git, Linux, Blockchain (Ethereum), SQLite