Allen Cao

Incoming Software Engineering Intern @ Baxter, June 2022 - August 2022

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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)*

- *Relevant Coursework*: Interpretation of Computer Programs, Data Structures, Efficient Algorithms, Computer Architecture, Artificial Intelligence, Discrete Mathematics and Probability, Linear Algebra, Information Devices and Systems

WORK EXPERIENCE

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.
- 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 faulty software.
- Designed and implemented an algorithm using C++ OpenCV 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.

Computer Science Mentors   **Berkeley, CA**

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 involving sanity checks on concepts and programming puzzles during weekly sections.

PROJECTS

Pathfind Visualizer | JavaScript (React), HTML, CSS

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

- Built an interactive online React application that visually displays pathfinding algorithms on a 2D grid.
- Optimized algorithm runtimes to calculate algorithm steps instantaneously and display visited cells and resulting paths smoothly.
- Visualizable algorithms include BFS, DFS, Dijkstra's, A*, Greedy Best First Search, Randomized Prim's, and Inverted Randomized Prim's (self-discovered).
- Released the project to students in UC Berkeley's data structures (CS61B) course as a visual aid to learning 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 an Express.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 OpenMP (MIMD) and SSE (SIMD) 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.

SKILLS

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

Frameworks/Applications   NumPy, Node.js, Express.js, React, OpenCV, OpenMP, Git, Amazon Web Services, Linux, Ethereum