Charlie Cooper

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EDUCATION

University of California, Berkeley **May 2025**
BA in Computer Science, BA in Applied Mathematics **GPA: 3.82/4.00**

- **Computer Science Coursework:** Operating Systems (A), Deep Neural Networks, Machine Learning, Databases, Cyber Security, Data Structures & Algorithms, Computer Architecture
- **Mathematics:** Advanced Linear Algebra, Combinatorics, Real/Complex Analysis, Probability, Abstract Algebra, Differential Equations, Numerical Analysis

TECHNICAL SKILLS

Languages: Python, C, C++, Java, GoLang, SQL, MATLAB
Frameworks/Tools: Git, PyTorch, Postgres, Docker, NumPy, Pandas
Systems: Linux/Unix Scripting, SSH, GDB, Object Oriented Programming
Cloud: AWS S3, AWS EC2

PROJECTS

Live MUNI Vehicle Tracker | Python, FastAPI, Docker, PostgreSQL, AWS S3 **Fall 2025**

GitHub | Live Demo

- Built automated 24/7 data pipeline processing 520k+ vehicle records daily with Docker on Raspberry Pi
- Implemented tiered storage strategy: PostgreSQL partitioning (3.5M records/week) with automated S3 archival using Glacier tiers for cost-effectiveness
- Deployed async FastAPI backend serving real-time transit data with <100ms query latency
- Created interactive web visualization tracking 500+ buses across 60+ routes using Leaflet.js and JavaScript

Operating System Implementation | C, GDB, Git **Spring 2025**

- Designed and implemented a fully functional operating system with three peers.
- Coded 15+ kernel system calls, as well as support for multithreaded user programs and a filesystem with fine-grained concurrency control.
- Developed strong understanding of concurrency by implementing thread-safe system calls and file operations using POSIX-like APIs, debugged over 50 edge cases across multithreaded workloads using GDB.
- Personally designed locking mechanisms to allow multi-threaded access to the filesystem through a buffer cache - achieving a 4x speed-up in disk access.

WORK EXPERIENCE

Fibonacci Web Studios | PHP, CMS Backdrop, Ddev, MySQL **Palo Alto, CA**
Contract Software Developer *Oct 2025 - Present*

- Debugged and resolved OpenID Connect authentication module for client CMS platform
- Conducted code review and submitted PR for user information processing pipeline
- Worked with Backdrop CMS and DDEV local development environments

UC Berkeley Computational Cognitive Science Lab **Berkeley, CA**
Undergraduate Researcher; Advisor: Professor Bill Thompson *Aug. 2024 - Feb 2025*

- Used sensor fusion techniques (e.g., Kalman filters, stochastic processes) to model how people integrate information from multiple sources in social networks.
- Contributed to paper drafts and weekly discussions through literature review and performance reporting.

Joby Aviation | *Python, NumPy, MATLAB* **Santa Cruz, CA**
Software Engineering Intern *May 2019 – Aug 2019*

- Worked as an intern at Joby Aviation in the early days when the autonomous flight team was just six people.
- Was responsible for porting flight code from MATLAB to Python while maintaining efficiency and integrity in performance.
- Ran data collection tests on LiDAR equipment the team was considering using for the craft.

INTERESTS

Distance running, acrylic painting