

Kaleb Crans

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EDUCATION

The University of California, Davis

Graduated March 2023

B.S. in Applied Mathematics, Computer Science Minor

3.65 GPA

- **Computer Science Coursework:** Object Oriented Programming, Data Structures and Algorithms, Computer Architecture & Assembly Programming, Discrete Math, Databases, Machine Learning
- **Math Coursework:** Multivariate Calculus, Statistics, Linear Algebra, Probability Theory, Real Analysis, Stochastic Processes, Differential Equations, Complex Analysis, Numerical Analysis, Optimization
- Outreach Coordinator for Davis Computer Science Club
- Dean's Honor List

TECHNICAL SKILLS

Languages: Python, C/C++, Javascript, and SQL

Libraries: NumPy, Matplotlib, pandas, Tidyverse, and PyTorch

Developer Tools: Git, Linux, Bash scripting, Docker

PROJECTS

Micromacro | C++, C, Python, Swift

February - March 2024

- Developed firmware intended for custom keyboards using ESP32-C3 microcontrollers
- Added support for extensive customization, n-key rollover, and debouncing
- Created native clients in C++ and Swift for Windows and MacOS respectively

Ray Bandit | C and C++

January 2024

- In order to explore computer graphics, I built a CPU raytracer with physically based rendering features
- Supports Lambertian (diffuse), metallic (specular), and clear (dielectric) materials
- Has a simple declarative interface to create scenes, and outputs renders in either ppm or jpeg formats
- Can render triangulated surfaces defined in STL files

Data Analysis of Little Free Libraries | R + Python

April 2023

- Used python to scrape data from littlefreelibrary.org and the associated map API
- Aggregated the (messy) data from multiple endpoints and transformed it into one dataset
- Performed regression analysis in conjunction with county-level ACS (American Community Survey) data

L-Store Database System | Python

January – March 2022

- Developed a python-based version of L-Store, an experimental HTAP database system with columnar storage
- Experimented and visualized the effects of different bufferpool sizes on performance
- Created a simplified SQL-like query interface that supports operations like select, update, sum, etc.
- Used the threading Python module for multithreading with a strict 2PL concurrency protocol

EXPERIENCE

Research Intern

April 2022 – December 2022

Bales Lab

Davis, CA

- Worked on an app written in python designed for running visual stimuli experiments with non-human primates
- Incorporated feedback and suggestions from lab researchers throughout the whole development process
- Wrote multiple GUI utilities to make common administrative tasks easier for end-users
- The result is a multi-platform application which is easy to configure with JSON, has many more features than what was used previously in the lab, and can be adapted for entirely new experiments

Undergraduate Reader

September 2021 – May 2022

UC Davis

Davis, CA

- Performed grading duties in undergrad math courses
- Worked with professors and TAs to make grading schemes for homework assignments
- Read for each course in the Real Analysis sequence, Combinatorics, and Intro to Abstract Math

Eagle Scout

May 2019

BSA

Troop 99