

Malcolm Kaplan

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EDUCATION

University of Illinois at Urbana-Champaign

Champaign, IL

Bachelor of Science in Computer Science and Anthropology – 3.98 GPA

August 2021 – Present

- Honors: Phi Beta Kappa; James Scholar; Dean's List; Phi Eta Sigma National Honor Society, Alpha Chapter

EXPERIENCE

Computer Architecture Course Assistant

January – May 2024

University of Illinois at Urbana-Champaign

Champaign, IL

- Held office hours to guide students through the creation and debugging of lab assignments focused on CPU design and optimization in Verilog, MIPS Assembly Language, C, and C++
- Taught students topics in computer optimization, including pipelining, caching, parallelism, and virtual memory

Software Engineering Intern

June – August 2022, May – August 2023

AvTech Corp.

Des Plaines, IL

- Created an app using Python, MicroPython, Java, and JavaScript to efficiently and securely communicate with proximity beacons via LoRaWAN technology, allowing for remote access and modification of transmitted data
- Created a VBA (Excel) program to algorithmically assign van drivers to service flights given a set of constraints, including shift times and weight capacities, saving hours of manual work for airport staff each day
- Manually parsed through huge codebases to implement new features and find bugs
- Thoroughly tested new features on existing applications prior to public releases
- Actively communicated with clients to ensure that the company's programs met their exact criteria
- Wrote detailed project reports to submit to clients, guiding users through the setup and running of the programs

Discrete Structures Course Assistant

January – May 2023

University of Illinois at Urbana-Champaign

Champaign, IL

- Held office hours, attended discussion sections, and answered student questions on course forums to help teach students fundamental computer science topics including algorithm analysis, boolean algebra, recursion, and graphs

PROJECTS

Linux-Like Kernel | C, x86 Assembly, GDB, GitLab

March – April 2024

- Led 4 engineers to develop a Linux-like monolithic operating system, authoring over 13,000 lines of code
- Engineered infrastructure for running and switching between multiple processes seamlessly, including scheduling, system calls, and interrupt handling
- Implemented features to ensure security and speed, including virtualized memory and file system abstractions
- Developed comprehensive device drivers for keyboard, terminal, real-time clock, and timer

Elden Ring Speedrun Optimizer | C++, Python, Matplotlib, Make, GitHub, Docker

May 2023

- Created a program to read in locations from the Elden Ring video game and calculate an optimal speedrun route
- Developed modifications of Dijkstra's algorithm and the Floyd-Warshall algorithm to find shortest paths while simultaneously accounting for the intricacies of the game and enforcing a strict ordering of certain pathways
- Achieved calculated route times within 5% of actual speedrun world records, indicating high accuracy
- Visualized results by drawing a path on an image of the Elden Ring map using Python and Matplotlib

Machine Learning Model for Estimating CPU Performance | Python, Pandas, Scikit-Learn

November 2023

- Created a machine learning model that estimates the performance of a CPU given statistics such as the size of the cache and the number of memory channels

Personal Website | React, JavaScript, CSS, HTML, GitHub

November 2022

- Developed an interactive personal website to house resume and various other important things

SKILLS

Programming Languages: C, C++, Python, Java, Go, x86, MIPS, VBA, C#, Verilog, JavaScript, CSS, HTML, SQL

Tools, Frameworks, and Libraries: Git, GitHub, GitLab, GDB, Bash, PowerShell/Command Prompt, Docker,

NumPy, SciPy, Pandas, scikit-learn, React, Node.js, Flask, Make, XML

Multimedia Software: Photoshop and Sony Vegas, creating projects amassing over 1,000,000 total views on YouTube

ACTIVITIES

Association for Computing Machinery (ACM)

January 2022 – Present

- Active member of special interests groups relating to computer architecture ("SIGARCH"), human-computer interaction ("SIGCHI"), and video game development ("Game Builders")

Illini Classics Club, Treasurer

October 2021 – Present

- Handle membership dues and University-related monetary transactions and maintain accurate financial records