Tao Wang

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EDUCATION

Bachelor of Science, **Electrical Engineering**.
Engineering GPA: 3.945.
University of California, Davis.
Expected Graduation: June 2025.
Grade Level: **Junior**

RELEVANT COURSES

RISC-V Assembly Programming.
CPU Pipeline and Cache Optimization.
Cloud Computing and Internet of Things Devices.
Digital System Design and Testing.

PROJECTS

CPU Cache Simulation **GitHub**

- Developed a fully associative least-recently-used **(LRU) cache in C++** as a class to **model the CPU cache behavior** and analyze **cache hit** and **miss**.
- Achieved an **O(1) constant time complexity** in the **cache read** operation by designing a unique data structure with a hash map for quick address lookup and a linked list for **efficient LRU ordering**.
- Executed **30 test cases with 450+ lines of code** in the **C++ GoogleTest framework** to test the cache's LRU replacement policy and **response to unexpected inputs**.

Skills: *C++ (1+ years' experience), GoogleTest, Linux Command Line (2+ years' experience), CPU Memory System.*

RISC-V Floating Point Multiplication **GitHub**

- Implemented a **16-bit floating point multiplication** algorithm in the **RISC-V assembly language**.
- Accomplished a **25% reduction in code length** compared to Clang's compiler-generated RISC-V code, resulting in **enhanced register utilization and performance**.
- Extensive bit-wise operation and programming with the registers.

Skills: *RISC-V Assembly Programming (4+ months of experience), Processor Architecture.*

Unix Command Line YouTube Music Downloader **GitHub**

- **Developed** a **Python script** utilizing Pytube and MoviePy to **download YouTube music** to a laptop **50% faster** than through the online website.
- Wrote a Unix shell script that **automated** the Python script as a shortcut in the command line to quickly download music.

Skills: *Python Scripting (2+ years' experience), Unix Shell Scripting, Automation.*

Linux Sudoku Solver **GitHub**

- Designed and implemented a **recursive backtracking algorithm** that **solves 9x9 sudoku puzzles** through the **Linux command line** with **CMake**.
- Conducted **10 test cases** on the program with C++ scripts while **documenting** the progress with **Git version control**.
- **Debugged** a **program crash** caused by inputting an invalid sudoku puzzle, then added tests to validate sudoku.
- Enhanced user experience by **creating a graphical user interface** (GUI) through the **Qt Library**, **reducing the input time by 33%** and enabling the user to **interact with an app instead of the Linux terminal**.

Skills: *C++ Scripting, Linux Application, CMake Build.*

WORKING EXPERIENCE

Calculus and Physics Tutor, Academic and Tutoring Center, UC Davis, Sep 2022 - Present

- **Collaborated** with **5 other tutors** in a shared tutoring environment with **more than 15 tutees** and addressed tutee's diverse problems and needs.
- **Coached more than 7** Calculus and Physics students **individually** on Calculus 1 and General Physics materials to improve their understanding of the course.
- **Motivated** tutees when dealing with low test scores and **guided** them to **fix the problems** one by one.

Skills: *Verbal Communication (140+ hours of tutoring), Leadership, Team Working, Working Independently.*