Tao Wang

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EDUCATION

University of California, Davis **Sep 2021 – Jun 2025**

- **Major:** Bachelor of Science, Electrical Engineering.
- **Engineering GPA:** 3.924.
- **Coursework:** Semiconductor Device Physics, Analysis of MOS and BJT, CPU Cache and Pipeline Optimization, FPGA Programming with Verilog.

WORK EXPERIENCE

Software Engineering Intern, Cadence Design Systems, Pittsburgh Jun – Sep 2024

- Investigated a **O(n^2)** performance issue in the PCB software with Oracle Developer Studio's Performance Analyzer.
- Achieved **1800 times runtime speed up** by replacing the **O(n^2)** loop with a hash set to lower the time complexity to **O(n)**.
- Converted more than **50%** of a Cadence PCB design software from **C to C++** (**3300** C files).
- Fixed compilation errors with Emacs macros and Linux shell commands to automate the process.
- Verified undefined reference issues by using command line tools like nm to check the symbol table of an object file.
- Worked with a large Linux code base (one preprocessed C file could have **>150000** lines of code).
- Wrote a shell script to automate regression testing.
- Managed a project branch and rebased with Perforce in a multi-branch code base.

Skills: *C/C++ Compilation, Perforce, Shell scripting, Performance Analyzer.*

Calculus and Physics Tutor **UC Davis Academic Assistance and Tutoring Center** Sep 2022 – Jun 2023

- 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 solve abstract problems.

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

PROJECTS

Linux Sudoku Solver

- Designed and implemented a recursive backtracking algorithm in C++ 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 users to interact with an app instead of the Linux terminal.

CPU Cache Simulation

- 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.