Christine Le

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Education

University of California, San Diego — La Jolla, CA
B.S. in Computer Science and Mathematics — *Sept. 2023 – June 2027*

Relevant Coursework: Java Programming I, Basic Data Structures & OO Design, System Programming and Software Tools, Discrete Math & Graph Theory, Advanced Data Structures

Projects

Malloc Simulator | *C, Linux, gdb, Valgrind* — February 2025

- Developed custom memory allocation system implementing malloc() and free() functions with best-fit allocation policy and 16-byte alignment.
- Built dynamic memory management with block headers/footers, coalescing algorithms, and block splitting for optimal heap utilization.
- Implemented pointer arithmetic and bitwise operations to traverse heap blocks, manage metadata, and handle memory fragmentation.
- Created comprehensive testing suite with edge cases, stress tests, and memory validation using assert statements and custom heap visualization.

Pioneer Shell (Pish) | *C, Linux, gdb, Valgrind* — February 2025

- Developed a Unix-style command-line shell supporting interactive and script execution modes with command parsing and process management.
- Implemented built-in commands (cd, exit, history) with error handling and persistent command history storage in ~/.pish_history file.
- Built process management system using fork(), execvp(), and wait() system calls to spawn child processes for external program execution.
- Created robust input parsing with whitespace handling using string manipulation functions to break commands into argv arrays.

HackTravels | *VS Code, JavaScript, HTML/CSS, React, Express, MongoDB* — October 2024

- Developed a MERN stack web application for users to plan trips, log activities, and manage travel experiences.
- Built the front-end using HTML, CSS, and React with Next.js, ensuring a responsive and dynamic user interface.
- Designed and implemented APIs with Express.js for data retrieval, user authentication, and activity management.
- Integrated MongoDB for data storage and deployed the application using Vercel and Render for hosting and scalability.

Enigma Machine Simulator | *Vim, C, Linux, GDB, Valgrind* — January 2025

- Implemented a fully functional simulator of the World War II Enigma encryption machine in C.
- Developed the rotor mechanism, plugboard, and reflector components to accurately mimic the historical device's encryption process.
- Used Vim in a Linux environment for efficient code development and terminal-based workflow.
- Applied GDB for systematic debugging and Valgrind to ensure proper memory management and prevent leaks.
- Created a command-line interface allowing users to configure rotors and encrypt/decrypt messages.

Extracurriculars

Women in Computing — Sept. 2024 - Present
Member — *UCSD*

- Participate in workshops and collaborative computing projects to enhance technical skills and support women in technology.
- Attend networking events to foster connections and empower women in the tech industry.

Technical Skills

Languages: Java, Python, C/C++, JavaScript, HTML/CSS, Bash
Frameworks: React, Node.js, Next.js, JUnit, Express
Developer Tools: VS Code, Vim, Eclipse, Git, GitHub, Postman, GDB, Valgrind, Make, Linux/Unix
Libraries/Databases: pandas, PIL, Matplotlib, MongoDB