Erica (Xuan) He

778-999-2637 hexuan426@gmail.com
Website GitHub LinkedIn

Skills

- Language: C/C++, Java, JavaScript, SQL, Python, HTML/CSS, PHP, MATLAB, System Verilog, ARMx64
- Tools: JUnit, GDB, React, Node.js, MySQL, MongoDB, PostgreSQL, Bootstrap, Material-UI, Sklearn, WebSocket, jQuery, REST API, Azure Cloud, Linux/Window development

Education

University of British Columbia Expected May 2026
Bachelor of Applied Science - Computer Engineering GPA: $83_{/100}$
Courses: Java OOP, D.S. & Algorithm C++, Web Dev, Database Design, Computer Networking, Operating System

Technical Experience

Research Assistance - Generative AI **UBC Sauder School of Business** 2024.04 - Present

- Developed and optimized advanced gesture classification models using Generative-AI and Python (Pandas, Sklearn), achieving a 30% improvement in accuracy and processing speed for automated image analysis systems.
- Led performance benchmarking for cutting-edge multimodal LLMs (Llava 3, gemini 1.5 Pro, GPT4), improving model training and validation processes by 25% through innovative data processing and labeling techniques.

Software Member - Pianobot **UBC Open Robotics** 2022.09 - 2023.11

- Engineered a translation system in C++ and Python to convert MIDI files into robot-readable data sequences, detailing hand positions and keyboard actions, crucial for real-time robotic control and performance accuracy.
- Designed and implemented rigorous unit and regression testing protocols to ensure the reliability and robustness of the system, aligning with industry best practices for software quality assurance.

Projects

Pub-Sub with Twitter

- Implemented a Java-based OOP application interfacing with the Twitter API, allowing users to manage and access real-time data efficiently, demonstrating skills in API integration and real-time data processing.
- Engineered a data caching system, reducing latency by slashing data retrieval operations by 50%. Employed advanced threading and synchronization techniques to enhance integrity.
- Used JUnit for comprehensive unit and functional testing, ensuring component functionality and reliability.

OS/161 System Development

- Leveraged C and OOP to implement virtual memory management in OS/161, optimizing TLB, page allocation, and address space management for improved memory efficiency.
- Developed key process management features, including PID management and syscalls such as $execv$ and $waitpid$, streamlining process control and synchronization.
- Implemented robust file system operations and synchronization tools, improving file descriptor management and implementing semaphores and condition variables for effective resource sharing.

IP Routing

- Developed C++ simulations for Link State and Distance Vector routing protocols, integrating advanced OOP practices with graph algorithms and efficient data structures to achieve an optimal $O(n\log n)$ runtime for shortest path, significantly enhancing network routing performance.

Reliable UDP

- Designed and implemented a high-performance UDP-based data transmission system in C, showcasing deep expertise in socket programming and achieving over 70% bandwidth utilization and reliability under varying network conditions.
- Developed congestion and flow control mechanisms to ensure efficient and fair network resource usage, contributing to stable and predictable system behavior in distributed environments.

Maze Game

- Developed a complex maze generation and solving application in C++, which included designing and rendering hexagonal maze layouts. Implemented custom queue and stack structures using C++ vectors to manage maze traversal states, demonstrating deep proficiency in C++ OOP and advanced problem-solving capabilities.

CSMA/CD Simulator

- Developed a CSMA protocol simulator in C++ for analyzing link layer behaviours, focusing on collision management, throughput optimization, and random back-off mechanisms.