

Lin Hong

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10× Hackathon Winner · Systems Software Engineer · Embedded Systems & Linux Development

EDUCATION

University of Waterloo

Sept 2024 – Apr 2028

Bachelor of Computer Science (Co-op)

- President's Scholarship of Distinction, Ted Rogers Future Leaders Scholarship for Women
- Relevant coursework: Data Structures & Algorithms, Computer Architecture, Operating Systems, Calculus 1 & 2

SKILLS

Languages: C++, Python, Go, Java, JavaScript, TypeScript, Bash, Shell Scripting

Technologies: Linux, Docker, Git, Nginx, PostgreSQL, MongoDB, AWS

Systems: Operating Systems, Embedded Systems, Real-Time Systems, Multi-Threaded Programming, Computer Networking, Data Structures & Algorithms

EXPERIENCE

FTC Robotics

Sept 2022 – June 2025

Senior Software Lead

Toronto, ON

- Engineered real-time telemetry pipelines aggregating encoder, IMU, and camera data into unified robot state estimation using **multi-threaded** programming and signal processing algorithms.
- Designed signal filtering and validation logic for **embedded systems**, eliminating noisy sensor readings and improving reliability by 20% while doubling response speed through optimized **memory management**.
- Implemented PID control algorithms with hardware engineers, improving autonomous navigation accuracy by 70% through real-time **process control** and sensor fusion.

Walnote AI

July 2025 – Present

Founding Engineer

Toronto, ON

- Optimized large-scale video rendering pipeline, reducing processing time by 5× through segment-based parallelization, **multi-threaded** processing, and backend optimizations.
- Implemented **WebSockets** with Redis pub/sub event broadcasting for real-time synchronization, demonstrating expertise in **computer networking** and distributed systems architecture.
- Built scalable REST APIs using FastAPI, **Dockerized** services, and asynchronous Celery workers orchestrated through Redis, demonstrating proficiency in **Linux** system administration and containerization.
- Deployed infrastructure using GitHub Actions for CI/CD, Cloudflare R2 for object storage, and managed **PostgreSQL** databases with optimized connection pooling and query performance.

PROJECTS

HomeLab | *Linux, Docker, Nginx, Cloudflare, TCP/IP*

May 2025 – Present

- Built a personal **Linux** server secured with SSH key-pair authentication and HTTPS reverse proxying, implementing **OSI model** networking principles and **TCP/IP** socket programming.
- Deployed **Dockerized** applications with process management and **Linux** kernel-level optimizations, developing deep understanding of **operating systems**, load balancing, and system architecture.

Chess Bot | *PyTorch, Modal, Python, HPC*

June 2025

- Built an AlphaZero-style chess engine with advanced **data structures** and algorithms, implementing Monte Carlo Tree Search with optimized time/space complexity for high-performance computing.
- Ran distributed training on A100/H100 GPUs via Modal, achieving high-throughput parallel processing and demonstrating expertise in **multi-threaded** programming and **computer architecture** optimization.

Skip the Walk | *Terraform, Commander.js, Bash, Automation*

Sept 2024

- Built a CLI automation tool for workflow orchestration using **Terraform** and **Bash** scripting, demonstrating proficiency in infrastructure automation and **Linux** command-line tools.
- Integrated API services and routing logic, showcasing understanding of **computer networking** protocols and system integration patterns.