

ASHISH AGGRAWAL

Toronto, ON | LinkedIn: [Insert URL] | GitHub: [Insert URL] | Portfolio: [Insert URL]

PROFESSIONAL SUMMARY

Systems & Machine Learning Engineer executing a strategic career pivot from 12+ years of global operational leadership—most recently at Amazon—to low-level systems programming. Expert in bridging the gap between hardware optimization (C++ / Linux Kernel) and predictive intelligence (AI / ML). Leveraging a decade of high-stakes problem-solving to architect automated, scalable architectures for High-Frequency Trading (HFT) and OS Kernel environments.

TECHNICAL SKILLS

- **Languages:** C++ (STL, Templates, Smart Pointers), C (Memory Management), Python (NumPy, Pandas, Scikit-Learn), Bash, Assembly (x86).
- **Systems Engineering:** Multithreading (std::thread, atomics, mutex), Inter-Process Communication (IPC), OS Kernel fundamentals, Device Drivers, Memory Management (Stack vs Heap, Cache Locality).
- **AI & Machine Learning:** Neural Networks (Feed-Forward, Backpropagation), NLP Fundamentals, Computer Vision (OpenCV concepts), LLM Integration, Predictive Modeling, Regression Analysis.
- **Tools & Environment:** Linux, Make/CMake, Git, Docker, VS Code, SQL, Tableau, Excel (Advanced).

PROJECTS

1. Driver_Forge | Automated Kernel Driver Generator

- **Objective:** Automating the identification of unknown hardware to generate functional C-language kernel drivers.
- **Implementation:** Designing a system to interface with camera input for component recognition, scraping datasheets, and utilizing LLMs to synthesize driver code structures.
- **Tech Stack:** C, C++, Linux Kernel Modules, LLMs (Ollama/Llama), Computer Vision (OpenCV), System Calls, Bash.

2. High-Frequency Logistics Simulator | Low-Latency Systems (C++)

- **Concurrency:** Implemented a **Producer-Consumer** architecture using std::mutex and std::condition_variable to synchronize high-volume concurrent threads without race conditions.
- **Optimization:** Optimized buffer memory constraints to handle "burst" data ingestion, preventing overflows and ensuring thread safety under heavy load.
- **Tech Stack:** C++20 (Smart Pointers), POSIX Threads (pthreads), std::mutex, GDB, Valgrind, Make.

3. Neural Network Framework from Scratch | C++ (No External Libs)

- **Performance:** Manually implemented Forward/Backward Propagation using matrix operations, optimizing memory allocation for weight matrices to maximize **L1/L2 CPU cache hits** and reduce execution time.
- **Tech Stack:** C++17, Linear Algebra, Memory Management (Manual Allocation), SIMD (Optimization concepts), CMake.

PROFESSIONAL EXPERIENCE

Amazon Air | Senior Program Manager *Ontario, Canada | Aug 2022 – Sept 2023*

- **ML & Automation:** Directed the implementation of internal **ML-based automation** models to optimize volume capacity planning across North American sites by partnering with Data Scientists and Software Engineers to train predictive algorithms on historical load data.
- **Data Engineering:** Engineered capacity analysis frameworks to resolve critical throughput bottlenecks by utilizing SQL queries to deep-dive massive Amazon Air datasets and collaborating with BIEs to visualize utilization gaps.
- Overhauled operational planning protocols to accelerate the adoption of new research capabilities by executing internal "Go-to-Market" strategies and change management frameworks for tool deployment.

Amazon Logistics | Site Operations Manager *Ontario, Canada* | Aug 2020 – July 2022

Managed high-volume operations for a 500,000 sq. ft. facility, leveraging analytical tools to drive a 22% productivity increase and over \$2.5M in projected cost savings. Architected network-level logistics programs and orchestrate critical load planning, achieving region-leading throughput (51.2 TPH) through dynamic resource allocation and system stability modeling.

Prior Operational Management Experience

Includes roles at Fresh Start Foods, Maxxam Analytics, and Vikram Laboratories Successfully handled operations across manufacturing and lab environments with a focus on process efficiency and fault tolerance. Refactored scheduling logic to eliminate bottlenecks, increasing output by 77% and uptime by 90%. Enforced rigorous QC standards to maintain zero data integrity failures in high-volume workflows and re-engineered procedures to cut setup times by 20%.

EDUCATION

Bachelor of Science (Honours), Computer Science Trent University, Peterborough, ON | Expected April 2027

- *Distinction:* Dean's Honour Roll.
- *Key Coursework:* High Performance Computing, Operating Systems, Systems Programming, Computer Networks, Computer Organization, LLMs & NLP, Applied AI, Data Mining, Probability 1, Linear Algebra, Calculus I/II.

Bachelor of Technology, Biotechnology Rai Foundation Engineering College, India