Syed Maroof Hussain

syedmaroofhuss@gmail.com | smhussa22 | syedmarhuss

Experience

Microsoft C++ Standard Library Sep 2026 – Present

Open Source Contributor

- Contributed **performance optimizations** to the **ranges** library in Microsoft's **C++ standard library**.
- **Benchmarked** code to confirm speedup for **several standard library algorithms** by up to **7x**.
- Wrote **unit tests** to verify the new behavior and make sure existing behavior was not affected.

Monero – Secure, Private, Untraceable Cryptocurrency Sep 2026 – Present

Open Source Contributor

- Contributed to the **C++** core of a 12-year-old **cryptocurrency** handling over **27,000+ daily transactions**.
- Patched a **DNSSEC security vulnerability** ignored for **6+ years**, closing a **poisoning attack** before it could be exploited.

PCapPlusPlus – C++ Packet Parsing & Creation Library Sep 2026 – Present

Open Source Contributor

- Implemented **packet parsing, creation, and serialization** for the **Bluetooth HCI** protocol in a **3,000+ star** open-source **C++** library, closing a **3-year-old** feature request.
- Helped modernize the code to **C++14**, preventing **memory leaks**, making it more **stable** and **maintainable**.

Bachelor of Computing Academic Society – University of Guelph Oct 2025 – Apr 2026

VP Technology

- **Redesigned the society's website** improving performance to serve **thousands of requests per day.**
- Ran **workshops** for **hundreds of students** on **computer networks and performance optimization** in **Linux**.

Projects

Maroof Street | *C++, gRPC, Protobuf, Kafka, Redis, PostgreSQL, Docker, AWS EKS* *GitHub* | *Demo*

- Built a **distributed stock exchange** around my **C++** matching engine, with a **gRPC** order gateway, **pre-trade risk checks**, and trading bots in **4 languages** (Python, Go, Rust, Java) across **5 stocks**, with a public live demo.
- Logs every order to **Kafka** for replayability, and runs on **Kubernetes (AWS EKS)** with one engine per stock.
- Benchmarked to show **99.9% of orders matched in under 1 μs**, with **5 ms** from order to fill p99 latency.

Price Matching Engine | *C++, CMake, Linux Ubuntu, GoogleTest, maroof.net* *GitHub*

- A **limit order book** matching engine in **C++** with **price-time priority**, processing **58 million+ orders/sec**, taking orders over my own **maroof.net** networking library to simulate a low-latency exchange.
- Benchmarked with **99.9% of orders matched in under 1 μs**, and **under 400 μs** end-to-end over UDP loopback; correctness verified by a **GoogleTest** suite. Full benchmarks in README.

maroof.net | *C++, CMake, Wireshark, tcpdump, Linux Ubuntu, GoogleTest* *GitHub*

- Created a low-latency **UDP/IP networking library** in **C++**, analyzed with **Wireshark** and **tcpdump**.
- Applied **data-oriented design** with techniques such as **object pools, cache-aligned SPSC queues, min-heap retransmission timers, CPU pinning, and batched syscalls**.

FileSpark | *Java, Spring Boot, AWS S3, MongoDB, Maven, Selenium, JUnit* *GitHub* | *Site*

- Launched a cross-platform **file sharing app** used by **100+ users**, supporting **thousands of user requests.**

Unchained | *TypeScript, Python, React.js, Next.js* *GitHub*

- Built a **predictive tool** to forecast hospital supply chain shortages, winning **3rd** at WesternAI hackathon.

Technical Skills

Programming Languages: C++, Python, Bash, Java, TypeScript, PostgreSQL
Tools/Skills: Linux, CMake, Boost, Apache Kafka, gRPC, Protobuf, Redis, Git, GoogleTest, CMake, Wireshark, tcpdump, TCP/IP Networking, GitHub Actions, Docker, Kubernetes, AWS, JUnit, Spring Boot, MongoDB

Education

University of Guelph Guelph, ON, Canada
Bachelor of Computing, Honours Computer Science | GPA: 3.7/4.0 (Dean's Honours) Expected May 2028

Relevant Coursework

Data Structures & Algorithms, Analysis & Design of Computer Algorithms, Introduction to Statistics, Parallel Programming, Operating Systems, Computer Networks, System Analysis and Design in Applications