Muhammad Taha

m_taha45160@live.com | (434) 882 3147 | https://www.linkedin.com/in/mtaha45160/ | https://github.com/taham0

Summary: **Software Engineer** with a Master's in Computer Science and expertise in building **scalable, fault-tolerant infrastructure**. Experienced in optimizing distributed systems for **performance and reliability**, from low-level network protocols (Rust, C++) to cloud-native orchestration (Kubernetes, AWS). Proven ability to diagnose complex production failures, improve system throughput, and engineer rigorous testing frameworks for production-grade applications.

Education

Purdue University, **MS CS**, West Lafayette, IN — Aug 2023 - May 2025
Related Coursework: Networks, Compilers, Algorithms, Distributed Systems, Fault Tolerant System Design, Network Security

Lahore University of Management Sciences, **BS CS**, Lahore, PK — Aug 2019 - May 2023
Related Coursework: Software Engineering, Databases, Operating Systems, Networks, Deep Learning, Statistics, Probability, Linear Algebra

Experience

System Software Engineer, Core Blockchain Team | Mobby AI | Seattle, Washington — July 2025 - Present

- **Core Protocol:** Led the design and implementation of a new reputation algorithm, including the transition to a weighted endorsement model, and Multi-Signature UTXO support
- **Systems Debugging:** Eliminated **recurring storage panics** using **safe future recovery logic** by implementing a state overwrite mechanism for dropped futures, preventing node crashes during read request timeouts
- **Performance Optimization:** Conducted **memory profiling** using industry-standard tools (bytehound), isolating a leak in the garbage collection logic that cut memory consumption by **35%**
- **Distributed Consistency:** Prevented distributed state corruption by replacing non-deterministic floating-point operations with fixed-point arithmetic, **eliminating consensus failures** caused by minute **precision differences** across different architectures
- **Testing:** Expanded test coverage by **22%** by adding new scenarios for endorsements, rewards, reputation, UTXO and network modules; this rigorous testing directly exposed multiple latent logic bugs

Research Software Engineer | Cisco Research & Purdue Engineering | West Lafayette, IN — Sep 2023 - Aug 2024

- Implemented vector aggregation directly on the **Data Plane using P4** for programmable switches, offloading weight aggregation from mobile GPUs to optimize distributed ML inference
- Improved sensor node throughput by **82.3% using native POSIX socket programming** (avoiding middleware overhead) by engineering a custom multi-threaded C pipeline for real-time data ingestion

Software Research Intern | IBM Research & UIUC | Remote — May 2022 - Aug 2022

- Built an automatic testing framework to stress-test quality and robustness of Kubernetes (K8s) operators in Python **(120+ Github stars)**; found **50+ critical bugs** in **11 operators** (Kafka, Knative, Zookeeper, etc.)
- Increased tool precision by reducing false positive rate from **72.1% to 13.5%** through root cause analysis of **500+** false alarms using system state objects, container logs, and debugging controller source code

Projects

Open-Source Contributions to MongoDB

- Prevented costly system downtime by identifying and fixing **5 confirmed bugs** in official MongoDB Operator code due to configuration errors, resource leaks, inconsistent resource specifications

Distributed Key-Value Storage using RAFT Distributed Consensus Algorithm

- Implemented leader election, log replication, and fault tolerance using persistent storage for a key-value storage system

Learning Management System for QPS High School Network

- Designed a full-stack web application, with a React frontend, RESTful backend in Node and Express, and relational database SQL schemas for efficient storage and retrieval of learning resources, real-time assessment, and feedback for **over 500 students**

Skills

Networking & Protocols: BGP, OSPF, ISIS, IPnIP, GRE, MPLS, TCP/IP, ZMQ, P4, Software-Defined Networking (SDN)
Cloud & Infrastructure: Kubernetes, Docker, AWS (EC2, S3, EKS), Linux/Unix, Terraform
Automation & Languages: Rust, C++, Python, JavaScript, Ansible
Databases: MongoDB, DynamoDB, PostgreSQL, Cassandra, SQL, NoSQL
DevOps & Observability: Git, CI/CD, Jenkins, Prometheus, Grafana, ZMQ
Databases & Data: SQL, NoSQL, MongoDB, PostgreSQL, Kafka, RabbitMQ