Sheharyar Khalid

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EDUCATION

University of Virginia (UVA)— *Masters in Computer Science - **GPA:** 4.0/4.0* Aug 2023 – May 2025

- **Coursework:** Computer Networks, Economics of Distributed Systems, Graph ML, HCI, Machine Learning, Network Security

Lahore University of Management Science (LUMS) — *Bachelors in Computer Science* Aug 2018 – June 2023

- **Coursework:** Algorithms, AI, Data Structures, Data Science, Object Oriented Programming, OS, Software Engineering

SKILLS AND EXPERTISE

Programming Languages: C, C++, Python, Javascript, HTML, CSS, Haskell, Bash, MATLAB

Frameworks: Jupyter, Numpy, Pandas, Scikit-learn, Keras, PyTorch, Tensorflow, Express, NodeJS, ReactJS

Tools & Other: Jira, MongoDB, SQL, Redis, Git, Docker, Elasticsearch, Logstash, Kibana, JSON, Bug testing, Postman, CI/CD, Splunk

Soft Skills: Strategic Thinking, Problem Solving, Team Work, Presentation and Technical Writing, Communication

WORK EXPERIENCE

C++ Developer - *LAVA Lab (UVA)* Mar 2024 – Present

- Led a cross-functional team to design and implement a high-performance C++ engine for graph matching on streaming log data, achieving sub-millisecond inference times and reducing attacker dwell time by **99%** while managing **100 Gbps** network traffic.
- Developed a novel bloom-filter-based engine in C++ leveraging hashmaps (Boost), parallel processing, and garbage collection for high performance and minimal memory overhead.

Research Software Engineer - *LAVA Lab (UVA)* Aug 2023 – Mar 2024

- Implemented FPGA-based hardware acceleration for SIEM (Elasticsearch, Splunk) workloads for optimizing compute-intensive operations through hardware modules (Pipelined Architectures, Parallel Processing) achieving **400%** throughput improvement.
- Conducted rigorous performance profiling and bottleneck analysis of Elasticsearch (Python, Bash scripting, Docker) to automate the setup and testing processes.
- Improved detection latency to under 1 millisecond, saving enterprises millions of dollars in potential losses.

Research Software Engineer — *Internet Security and Privacy Lab (LUMS)* May 2022 – Aug 2023

- Developed a distributed real-time graph-matching engine for streaming log data using Wazuh, Kibana, and Logstash achieving a **30% improvement** in graph-building and matching performance.
- Used Docker for containerization to ensure modularity, scalability, and fault tolerance and Logstash and Kibana to preprocess and enrich log data and visualize graph-matching results.

SELECTED PROJECTS

Community Discussion Social Forum | Node, React, MongoDB, AWS, Express, Selenium, Postman **Github Link**

- Built a community discussion and social forum for LUMS to connect peers, organize events, submit course requests, discuss topics, and buy/sell items on an integrated marketplace.
- Implemented JWT, and developed REST APIs with Express.js and MongoDB, ensuring efficient backend operations.
- Designed and tested APIs using Postman and conducted end-to-end testing using Selenium.

Video Conferencing Using L4S | TCP/IP, Linux, Open vSwitches, L4S, Video Conferencing **Github Link**

- Implemented and evaluated L4S technology (Linux, TCP/IP) to optimize video conferencing performance across real-world network conditions achieving a **10x** reduction in latency and a **5x** decrease in jitter.
- Deployed a network testbed (Linux network namespaces, Open vSwitches) to evaluate L4S performance across multiple concurrent connections and analyzed key metrics including latency, throughput, and jitter.

Privacy-Preserving Health Application | UI Design (Figma), User Privacy, Anova Testing, A/B Testing, User Study

- Developed a HIPAA-compliant, privacy-preserving mobile health application, enhancing user data control and increasing user satisfaction by **50%** through effective UI design and robust privacy features.
- Conducted comprehensive evaluations and user studies, utilizing deep packet inspection, A/B testing, and ANOVA analysis to understand privacy policy comprehension, data-sharing awareness, and overall user satisfaction.