Mughees Ur Rehman

540-934-8608 | mughees@vt.edu| linkedin.com/in/mughees-ur-rehman | github.com/mughees-urrehman | **Available:** May, 2026

EDUCATION

Virginia Tech   Blacksburg, VA
Master of Science in Computer Science and Applications | CGPA: 4.00/4.00   August 2024 – May 2026
Coursework: Topics in Data & Information, System & Software Security, Large Scale Distributed Systems, Machine Learning, Network Architecture & Protocols

Lahore University of Management Sciences (LUMS)   Lahore, Pakistan
Bachelor of Science in Computer Science | CGPA: 3.97/4.00   September 2020 – May 2024
Coursework**:** Distributed Systems, Deep Learning, Computer Vision, Network Security, Software Engineering

EXPERIENCE

Data Security & Privacy Lab, Virginia Tech   Blacksburg, VA
Research Associate   August 2024 – Present
- Designed an LLM-driven network intrusion detection framework that automatically generates and validates **Suricata IDS** rules, aiding security analysts in rule development and analysis.
- Built a ground-truth pipeline by executing malware in Cuckoo sandbox, collecting PCAPs, and correlating triggered Suricata alerts with network flow-level traffic features.
- Embedded network flows using Doc2Vec and trained an autoencoder on benign traffic to identify malicious flows as anomalies.
- Implemented an adaptive feedback loop where malicious flow features are passed to an LLM to generate candidate Suricata rules, which are then iteratively evaluated and refined.

Analytics 4 Everyone   Pittsburgh, PA
Software Engineering Intern   June 2025 – August 2025
- Developed full-stack features using **React** and **Django**, with **PostgreSQL** as the database backend, for an AI-powered education platform designed to scale for **10,000+** concurrent users and **1M+** total users.
- Redesigned front-end routing and navigation state management to ensure consistent behavior across page refreshes and browser navigation, reducing client-side state errors.
- Built an automated data pipeline with task scheduling and **GCP Cloud Storage** integration for scalable data ingestion and storage.

EPFL   Lausanne, Switzerland
Research Intern   May 2024 – August 2024
- Worked at Network Architecture Lab, developed Selenium-based **Python** crawlers on **AWS EC2** to measure cache hit rates and latency across **25+** streaming platforms from **8** global distributed vantage points.
- Analyzed video streaming data to evaluate edge caching's impact on QoE, revealing hit rate disparities of **100%** vs. **30%** across platforms sharing the same CDN infrastructure.
- Demonstrated that cache hit-rate disparities cause **2–5s** differences in video startup delay and reduced delivered bitrates among streaming services sharing the same CDN.
- Co-authored *Edge Caching as Differentiation*, published at **ACM SIGCOMM 2025**, and awarded the Best Student Paper Award.

PROJECTS

Towards Fairer AI: Multi-Agent Debiasing of LLMs with Online Evidence Retrieval | Python, LLMs, RAG
- Designed a multi-agent framework that detects and mitigates social bias in LLM reasoning, using GPT-4, Claude-3 Haiku, and DeepSeek-R1 backbones.
- Reduced GPT-4's reasoning bias score from -**0.29** to -**0.04** and boosted accuracy from **71%** to **96%** on the BBQ-Hard benchmark by integrating a search agent for evidence retrieval, surpassing baselines.
- Published findings at the AAAI Fall Symposium 2025 conference.

Source Code Hotspots: A Diagnostic Method for Quality Issues | Python
- Contributed to a large-scale study analyzing long-term revision histories of diverse open-source software projects on GitHub.
- Helped develop a fine-grained approach for code churn analysis that moves beyond file-level metrics to identify exact sources of repeated code change.
- Identified systematic and often avoidable maintenance patterns, including churn amplified by automated bots.
- Published findings at the Mining Software Repositories (MSR) 2026 conference.

EnergyMonitor | JavaScript, React Native, MongoDB, Expo
- Developed a mobile app to track real-time household electricity usage with intuitive dashboards and analytics.
- Promoted eco-friendly energy management & reduced overall consumption by **35%** across **500+** appliances.

TECHNICAL SKILLS

- **Languages**: Python, JavaScript, TypeScript, Java, C++, C, C#, Go
- **Cloud Infrastructure**: Google Cloud Platform, AWS, Azure
- **Frontend Frameworks**: React, React Native, Angular
- **Backend Frameworks**: Node.js, Django, FastAPI, Flask, Spark
- **Databases**: MySQL, MongoDB, Postgres, Firebase
- **DevOps (CI/CD)**: Git, Docker, Kubernetes, Ansible, Metaflow, Jira