

# Mughees Ur Rehman

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## Education

### Virginia Tech

*Masters in Computer Science*

Cumulative GPA: 4.00/4.00

August 2024 – May 2026

Blacksburg, VA, USA

### Lahore University of Management Sciences (LUMS)

*Bachelors in Computer Science*

Cumulative GPA: 3.97/4.00

September 2020 – June 2024

Lahore, Pakistan

## Publications

### Edge Caching as Differentiation

*ACM SIGCOMM 2025*

September 2025

Coimbra, Portugal

- Muhammad Abdullah, **Mughees Ur Rehman**, Pavlos Nikolopoulos, Katerina Argyraki.
- [📄 Paper](#)
- [Best Student Paper Award](#)

### Source Code Hotspots: A Diagnostic Method for Quality Issues

*ACM MSR 2026*

April 2026

Rio de Janeiro, Brazil

- Saleha Muzammil, **Mughees Ur Rehman**, Zoe Kotti, Diomidis Spinellis.
- [📄 Conference Program](#)

### Towards Fairer AI: Multi-Agent Debiasing of LLMs With Online Evidence Retrieval

*AAAI Fall 2025 Symposium*

November 2025

Arlington, VA, USA

- **Mughees Ur Rehman**, Saleha Muzammil.

## Research Experience

### Data Security and Privacy Lab, Virginia Tech

*Research Associate*

September 2024 – Present

Blacksburg, VA, USA

- Conducting research with [Prof. Murat Kantarcioglu](#) on using LLMs to improve network security by automatically generating and evaluating Suricata intrusion detection rules.
- Analyzed malware samples from VirusTotal in the Cuckoo sandbox to collect PCAPs and study the Suricata alerts associated with each sample.
- Converted PCAPs into flow-level representations, embedded flows using a Doc2Vec model, and trained an autoencoder to separate malicious flows from benign traffic.
- Developed an LLM-based framework that uses malicious flow features to generate and verify Suricata rules, enabling adaptive intrusion detection for zero-day threats.

### EPFL

*Research Intern*

May 2024 – August 2024

Lausanne, Switzerland

- Worked under the supervision of [Prof. Katerina Argyraki](#) at the [Network Architecture Lab \(NAL\)](#), investigating how edge caching affects Internet fairness and neutrality across major CDN providers.
- Developed Selenium-based crawlers in Python, deployed on AWS EC2 instances across multiple regions, to measure cache hit rates and latency across 25+ streaming services.
- Analyzed disparities in cache performance within CDNs and showed how such variations can lead to QoE differences and traffic prioritization among competing content providers.
- Co-authored the paper [Edge Caching as Differentiation](#), published at **ACM SIGCOMM 2025** (Best Student Paper Award).

### Networks and Systems Group LUMS

*Research Associate*

June 2022 – May 2024

Lahore, Pakistan

- Worked under the supervision of [Prof. Zafar Ayyub Qazi](#) at the [Networks and Systems Group \(NSG\)](#), focusing on edge computing and stateful application migration in 5G environments.
- Developed a low-latency key-value datastore based on a custom hashed queue data structure to enable efficient state migration on the network edge. ([Project Repository](#))
- Initiated the project Re-thinking Redis for Edge Networks, addressing bottlenecks in Redis's blocking migration API and transforming it into an asynchronous, scalable operation.

## Professional Experience

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### **Analytics 4 Everyone**

**June 2025 – August 2025**

*Software Engineering Intern*

*Pittsburgh, PA*

- 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.
- Created an automated data pipeline with task scheduling and GCP Bucket integration for scalable storage.

### **Educative Inc.**

**June 2023 – August 2023**

*Technical Content Engineering Intern*

*Lahore, Pakistan*

- Authored 60+ technical articles on software engineering and applied mathematics, published on the Educative platform and optimized for discoverability through SEO best practices. ([🔗 Educative Article Publications](#))
- Implemented Docker based workflows to support Educative's embedded code runner, enabling users to execute interactive code examples directly within the articles.

## Teaching Experience

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### **Virginia Tech**

**August 2024 – Present**

*Graduate Teaching Assistant*

*Blacksburg, VA, USA*

- CS 2114 Software Design & Data Structures (current) , CS 5740 AI Tools for Software Engineering, CS 3114 Data Structures & Algorithms

### **LUMS**

**August 2022 – May 2024**

*Undergraduate Teaching Assistant*

*Lahore, Pakistan*

- CS 582 Distributed Systems, CS 535 Machine Learning, CS 473 Network Security, CS 210 Discrete Mathematics, CS 100 Computational Problem Solving

## Honors & Awards

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- Received the SIGCOMM 2025 Best Student Paper Award.
- Awarded \$1,500 CCI Commonwealth Cyber Initiative Grant (2024–2025) to support conference travel and academic development, recognized as a Cyber Innovation Scholar.
- Recipient of a full scholarship to attend the Richard Tapia Conference 2025.
- Awarded the LUMS Merit Scholarship, granted to the top 15 students in the batch with the highest academic standing.
- Placed on the LUMS Dean's Honor List (2020–2024).

## Academic Service

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### **Artifact Evaluator**

- USENIX Security 2026 ([🔗 Details](#))
- ACM SIGCOMM 2025 ([🔗 Details](#))

### **Reviewer**

- ACM Computing Surveys (CSUR) 2025

## Conferences & Presentations

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### **AAAI 2025 Fall Symposium Series**

**November 2025**

*Presenter*

*Arlington, VA, USA*

- Presented the short paper “Towards Fairer AI: Multi-Agent Debiasing of LLMs with Online Evidence Retrieval”.

### **Tapia Conference 2025**

**September 2025**

*Attendee*

*Dallas, TX, USA*

- Participated in workshops, career fairs, and represented Virginia Tech at the graduate school fair.

## Technical Skills

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**Languages:** Python, JavaScript, TypeScript, 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, Jira