Haseeb Ashfaq

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Anticipated Graduation Date: 05/26

EXPERIENCE

Nokia **June 2023 – August 2023**
Networking Research Intern New Jersey, USA

- Developed (in C++, Unix) a streaming service for AR/VR content for heterogeneous networks
- Implemented a resource-efficient transcoding mechanism for volumetric videos that achieved 75% CPU savings
- Developed an encoder/decoder for point cloud data that can tolerate packet losses in the network which enabled utilizing unreliable transport protocol (UDP) instead of TCP for point cloud streaming
- Implemented a mixed-reliability transmission protocol using QUIC streams and datagrams (with Cloudflare's Quiche)

Systems Group NYU **June 2022 – June 2023**
Graduate Research Assistant New York, USA

- Developed a trace-aware access control for microservices, implemented via Istio Envoy proxies.
- Designed and implemented a special priority queue, LOQ, for cloud hosted financial exchanges, that enhances a matching engine's throughput by up to 150% and lowers latency by 90%.
- Developed a cloud-native multicast service for market data that achieves 50% lower latency and better scalability than AWS TGW-based multicast. Prototyped in C++ and evaluated on AWS and GCP.

PosterMyWall **June 2020 – August 2021**
Software Engineer (Full Time) Lahore, PK

- Designed and implemented, in PHP and JS, an access control system for internal tools of the company
- Setup CI/CD pipeline along with testing infrastructure using TeamCity and AWS
- Automated AWS-hosted development infrastructure, shortening the testing cycle time by more than 50%
- Secured the product website by eliminating critical vulnerabilities (XSS, CSRF, IDOR) and did backend development
- A recommendation letter from my manager describing me as an exceptional engineer is available on LinkedIn

EDUCATION

PhD and MS, Computer Science **Sept. 2021 – May 2026**
New York University, New York, USA GPA: 4.0/4.0
Thesis Focus: Distributed Systems, Networks, Cloud Computing, Microservices, Financial Technologies

Bachelor of Science, Computer Science **Sept. 2016 – May 2020**
Lahore University of Management Sciences, Lahore, Pakistan GPA: 3.7/4.0
Courses: Algorithms, Data Structures, Distributed Systems, Computer Networks, Machine Learning

SELECT PROJECTS

Network Support For Cloud Hosted Financial Exchanges

- Implemented a low latency market data service that achieves less than 1-microsecond latency difference across receivers
- Utilized kernel bypass and zero-copy packet replication techniques to enable fast packet processing, implemented in C++
- Utilized eBPF/XDP and eBPF/TC for efficient packet processing when using Linux kernel

Efficiently Querying Distributed Tracing Data Stored In The Cloud

- Developed database indices specialized for cloud storage and distributed tracing data
- Supported fast graph-based queries for the tracing data, implemented in C++
- Outperformed Grafana Tempo in terms of query execution time, benchmarked on Alibaba tracing data

RESEARCH PAPERS

Design and Implementation of a Scalable Financial Exchange in the Public Cloud
[Arxiv Link]
*Muhammad **Haseeb**, Jinkun Geng, Ulysses Butler, Xiu Hao, Daniel Duclos-Cavalcanti, Anirudh Sivaraman*

A Scalable and Fair Multicast for Financial Exchanges in the Cloud
ACM Sigcomm Demos & Posters (Presented a poster in Sydney, Australia) [Link]
*Muhammad **Haseeb**, Jinkun Geng, Ulysses Butler, Xiu Hao, Daniel Duclos-Cavalcanti, Anirudh Sivaraman*

QuEST: Fast, Expressive, and Cheap Analytics for Distributed Traces Using Cloud Storage
CloudDB, a VLDB workshop [Link]
*Jessica Berg, Muhammad **Haseeb**, Haiming Chen, Yaojia Ju, Anirudh Sivaraman, Ravi Netravali, Srinivas Narayana*

To Block or Not To Block: Accelerating Mobile Webpages On-The-Fly Through JavaScript Classification
ICTD 2022 (Presented the paper in Seattle, Washington) [Link]
*Authors: M Chaqfeh, Muhammad **Haseeb**, W Hashmi, P Inshuti, M Ramesh, M Varvello, F Zaffar, L Subramanian, Y Zaki*

Using Application Layer Banner Data To Automatically Identify IoT Devices
ACM Sigcomm CCR 2020 [Link]
*Authors: Talha Javed, Muhammad **Haseeb**, Muhammad Abdullah, Mobin Javed*

INVITED TALKS

I have been invited to give talks about my work on low latency and scalable systems in the cloud.

Rutgers University: Network support for cloud hosted financial exchanges. 30/10/2024
Google: How to build an ultra-fast and scalable financial exchange on the public cloud? 12/03/2024

AWARDS, FELLOWSHIPS AND SERVICES

National Science Foundation (NSF) Travel Grant
Funds for traveling to ACM Sigcomm 2024 in Sydney, Australia

Outstanding Student Research Award
Granted by Nokia Bell Labs during Global Student Program 2023

HotNets Travel Grant
Funds for traveling to ACM HotNets in Boston, United States

Patent: A Method To Enable Fast Transmission And Processing Of 3D Telepresence Data Encoded As Octrees
Approved by Nokia's internal board, In submission to USPTO, Received Monetary Award from Nokia

Reviewer for ACM Journal on Computing and Sustainable Societies (JCSS)
Served as a peer reviewer for research articles submitted to ACM JCSS

MacCracken Fellowship
Granted by New York University for a Ph.D. in Computer Science

Summer Research Fellowship
Granted by Lahore University of Management Sciences for pursuing a summer research program

TEACHING

Networks And Mobile Systems, Spring 2023 at NYU
Financial Technologies, Spring 2024 at NYU
Operating Systems, Fall 2020 at LUMS
Data Structures, Spring 2019 at LUMS

SKILLS

C/C++, Python, PHP, SQL, Go, Javascript, React/React Native, Rust, AWS, Debugging, Testing, DPDK, eBPF, Linux, Kubernetes, Docker, Symbolic Execution, Parser program synthesis, Z3 Solver, Istio, Microservices

MISC.

LinkedIn: https://www.linkedin.com/in/haseeb-ashfaq-66248213b
Personal Site: https://haseeblums.github.io
Availability for internship: May 10, 2025 to September 10, 2025
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Legal Name: Muhammad Haseeb