

# MUHAMMAD TAIMOOR TARIQ

☎ 1-447-902-2306 ✉ [mttariq2@illinois.edu](mailto:mttariq2@illinois.edu) 🌐 [github.com/taimoortt](https://github.com/taimoortt)

## Education

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### University of Illinois at Urbana-Champaign

*PhD. in Computer Science*

- Advised by: Radhika Mittal

August. 2022 – Present

IL, USA

### Lahore University of Management Sciences (LUMS)

*Bachelor of Science in Computer Science*

- Placed on the Dean's Honors List for academic excellence for years 2020-2022

Sept. 2018 – May 2022

Lahore, Pakistan

## Publications

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### Enabling Emerging Edge Applications Through a 5G Control Plane Intervention

*Mukhtiar Ahmad, Ali Nawazish, M Taimoor Tariq, Basit Iqbal, Taqi Raza, Zafar Ayyub Qazi*

ACM CoNEXT 2022, Rome, Italy

### Neutrino: A Fast and Consistent Edge-based Cellular Control Plane

*Mukhtiar Ahmad, Ali Nawazish, M Taimoor Tariq, Usman Jafri, Adnan Abbass, Mashal Abbas, Zartash Uzmi, Zafar Qazi*

IEEE/ACM Transactions on Networking, 2022

### Fast Failure Detectors for 5G Edge Deployments

*M Taimoor Tariq, Maha Kamal, Vafa Batool*

Student Research Competition, SOSP 2021

## Research Experience

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### Slice-Aware Resource Management For 5G Networks

August-2022 - Present

*Research Assistant - Advisor: Dr. Radhika Mittal*

- Worked on projects related to Slice-aware Interference Management and Load Balancing for Multi Cell Deployments.
- **Under submission at Sigcomm 2025**

### Fast Failure Detectors for 5G Edge Deployments

March 2021 – May 2022

*Research Assistant - Advisor: Dr. Zafar Ayyub Qazi*

- Goal was to design an efficient system to detect failures in the cellular control plane
- Responsible for leading the design and implementation of a system based on distributed heartbeats
- Results showed a reduction in initial detection time by 50% and confirmation time by 30%, compared to existing systems

### Enabling Edge Applications Through a 5G Control Plane Intervention

June 2021 – September 2021

*Research Assistant - Advisor: Dr. Zafar Ayyub Qazi*

- Goal was to design a fault tolerant control plane by deploying replicated control plane nodes at the edge
- Implemented and evaluated the system against prior works (DPCM, ECHO, SkyCore) under varying network conditions
- Results showed an improvement of up to 3.8x in Procedure Completion Times under failure conditions

### Neutrino: A Fast and Consistent Edge-based Cellular Control Plane

June 2020 – March 2021

*Research Assistant - Advisor: Dr. Zafar Ayyub Qazi*

- Goal was to minimize latency in cases of user mobility by implementing a geo-aware, proactive state replication system
- Implemented a consistent-hashing based replication scheme which ensures the read-your-writes consistency model
- Results showed a reduction in Procedure Completion Times by up to 3.1x in cases of user mobility

## Projects

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### Apnay Rung | *ReactJS, NodeJS*

March 2021 – April 2021

- Built a UX-friendly React based frontend catering to diverse user roles e.g.Admin, Sellers, Customers
- Built and deployed a PostgreSQL Database for backend
- Built a REST API for efficient backend-frontend communication

### Raft-based Key Value Store | *Go*

October 2020 – November 2020

- Built a fault-tolerant distributed data storage system based on Raft

## Teaching Experience

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### Teaching Assistant

*CS-425: Distributed Systems*

**August 2024 – Present**

*UIUC, IL*

### Teaching Assistant

*CS-678: Topics in Internet Research (Graduate)*

**January 2022 – May 2022**

*LUMS, Pakistan*

### Lead Teaching Assistant

*CS-582: Distributed Systems (Graduate)*

**September 2021 – December 2021**

*LUMS, Pakistan*

### Teaching Assistant

*CS-382: Network-Centric Computing (Undergraduate)*

**January 2021 – May 2021**

*LUMS, Pakistan*

## Technical Skills

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**Languages:** C, C++, Python, Go

**Frameworks/Tools:** ZooKeeper, DPDK, Wireshark, NodeJS, ReactJS