ROHAIL ASIM

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SUMMARY

Applied systems researcher and engineer specializing in AI-powered networking, real-time systems, and web performance. I build scalable, latency-sensitive infrastructure ranging from 5G rate control protocols to ML-driven web optimizations grounded in rigorous experimentation, open-source tooling, large-scale data analysis, and real-world deployments in resource-constrained environments.

EDUCATION

New York University Sep 2020 - Aug 2025
PhD, Computer Science - Advisors: Yasir Zaki, Lakshminarayanan Subramanian
Title: Designing Efficient and Eqitable Networked Systems for Mobile Users in Emerging Regions
Committee: Yasir Zaki, Lakshminarayanan Subramanian, Talal Rahwan, Matteo Varvello, Anirudh Sivaraman
Relevant Coursework: Advanced Algorithms, Artificial Intelligence, Databases, Distributed Systems, Computer Graphics

Lahore University of Management Science (LUMS) 2015 - 2019
Bachelor of Computer Science - CGPA: 3.70/4.0 (*Graduated with Distinction*)
Relevant Coursework: Network Centric Computing, Distributed Systems, Advanced Programming, Artificial Intelligence

EXPERIENCE

Graduate Research Assistant Sep 2020 - Present
New York University Abu Dhabi *Abu Dhabi, UAE*
AI & Networked Systems

- **Enabling High Bandwidth Applications over 5G Environments:** Designed and implemented **Hera**, a modular QoE-aware rate control framework for AR/VR applications in 5G networks, integrating a custom TCP Linux kernel module in C with WebXR-based multi-user environments to reduce interaction latency by up to 66, improve video quality by 50% average bitrate Details Code
- **Rethinking Congestion Control for 5G:** Developed **Zeus**, a novel benchmarking framework for evaluating congestion control algorithms (CCAs) in 5G environments and led the most comprehensive cross-protocol measurement study to date across 5G environments using Python, Mahimahi, and NS-3 for repeatable, scenario-aware analysis Details Code
- **Connecting the Unconnected:** Developed **Sonic**, a novel connectivity system leveraging FM radio and SMS to deliver simplified, pre-rendered web content to low-end mobile devices in internet-deprived regions Details
- **Towards a world wide web without digital inequality:** Developed **Lite-Web**, a hybrid JavaScript optimization framework combining machine learning (ML) and rule-based analysis to reduce nonessential scripts, achieving up to 72% reduction in page load time and 54% reduction in JavaScript processing on low-end phones in underserved regions Media Coverage Details
- **Understanding and Mitigating Traffic Jams Using Edge AI:** Implemented a multi-agent Reinforcement Learning (RL) framework enabling autonomous vehicles to learn socially optimal routing strategies, achieving up to 30% lower average travel time and 50% fairer congestion distribution Details Code

AI & Sustainability

- **Rethinking homework in the age of AI:** Conducted a comprehensive study on the impact of generative AI on educational institutions, evaluating GenAI's performance in 32 university courses using bootstrapped Welch's t-tests and OLS regression, and exposing the unreliability of AI-detection tools through adversarial obfuscation attacks, with findings featured in major media outlets worldwide Media Coverage Details
- **Towards Sustainable AI Infrastructure:** Developed a modular Sustainability Calculator in Python to estimate carbon emissions of AI infrastructure, incorporating grid emission data and datacenter energy profiles, and using scenario-based simulations to evaluate carbon offsetting strategies Details

Software Engineer (Full Stack) Jan 2020 - Aug 2020
Educative Inc. *Lahore, PAK*
Educative is an ed-tech platform with over 2 million users that provides interactive and adaptive courses for software developers

- Migrated platform to Next.js to utilize server-side rendering (SSR) and client-side caching to improve SEO and reduce page load times up to 50%
- Created a Design System using Material-UI in TypeScript saving up to 50% of a developer's time to build UI components

- Increased test coverage by 50% using a testing infrastructure based on Jest, Unittest, and Selenium

PUBLICATIONS

[1] **The GAIUS Experience: Powering a Hyperlocal Mobile Web for Communities in Emerging Regions**
Rohail Asim, Arjuna Sathiaseelan, Arko Chatterjee, Mukund Lal, Yasir Zaki, Lakshminarayanan Subramanian
ACM ICTD 2024

[2] **SONIC: Connect the Unconnected via FM Radio & SMS**
Ayush Pandey, **Rohail Asim**, Khalid Mengal, Matteo Varvello, and Yasir Zaki
ACM CoNEXT '24

[3] **Impact of Congestion Control on Mixed Reality Applications**
Rohail Asim, Lakshminarayanan Subramanian, and Yasir Zaki
ACM SIGCOMM EMS 2024

[4] **I tag, you tag, everybody tags!**
Hazem Ibrahim, **Rohail Asim**, Matteo Varvello, Yasir Zaki
ACM Internet Measurement Conference (IMC) 2023

[5] **Perception, performance, and detectability of conversational artificial intelligence across 32 university courses**
Hazem Ibrahim, Fengyuan Liu, **Rohail Asim**, Yasir Zaki et al
Scientific Reports 2023

[6] **Rethinking homework in the age of artificial intelligence**
Hazem Ibrahim, **Rohail Asim**, Fareed Zaffar, Talal Rahwan, Yasir Zaki
IEEE Intelligent Systems

[7] **Towards a world wide web without digital inequality**
M Chaqfeh, **Rohail Asim**, Bedoor AlShebli, Fareed Zaffar, Talal Rahwan, Yasir Zaki
Proceedings of the National Academy of Sciences (PNAS)

[8] **ALCC: Migrating Congestion Control To The Application Layer In Cellular Networks**
Yasir Zaki, **Rohail Asim**, Muhammad Khan, Shiva Iyer, Talal Ahmad, Thomas Potsch, Lakshminarayanan Subramanian
Journal of Systems Research

[9] **Towards Next Generation Immersive Applications in 5G Environments**
Rohail Asim, Ankit Bhardwaj, Lakshminarayanan Subramanian, and Yasir Zaki
Under Review

[10] **The Quest for the Best: Evaluating Congestion Control in 5G**
Rohail Asim, Lakshminarayanan Subramanian, and Yasir Zaki
Under Review

[11] **Is AI Really Becoming Green?**
Rohail Asim, Ankit Bhardwaj, Yasir Zaki, and Lakshminarayanan Subramanian
Under Review

[12] **Modeling Economic Viability for Scalable AI Deployment in Emerging Regions**
Rohail Asim, Ankit Bhardwaj, Arjuna Sathiaseelan, Yasir Zaki, and Lakshminarayanan Subramanian
Under Review

[13] **Self-Regulating Cars: Automating Traffic Control in Free-Flow Road Networks**
Ankit Bhardwaj, **Rohail Asim**, Kevin Jin, Yasir Zaki, Lakshminarayanan Subramanian
Under review

HONORS & AWARDS

NYU Global PhD Fellowship 2020 – 2025
Dean's Honor List Academic Years 2017–2018, 2018–2019
Graduated with Distinction 2019

TECHNOLOGIES

Languages Python, C, C++, JavaScript, TypeScript, GoLang, HTML, CSS, Matlab, SQL, Haskell
Tools & Frameworks Wireshark, Linux, Git, Bash, Selenium, NGINX, NetEm, Mahimahi, Pandas, Numpy, Matplotlib